2040 Long Range Transportation Plan

ROCKINGHAM PLANNING COMMISSION

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This Plan 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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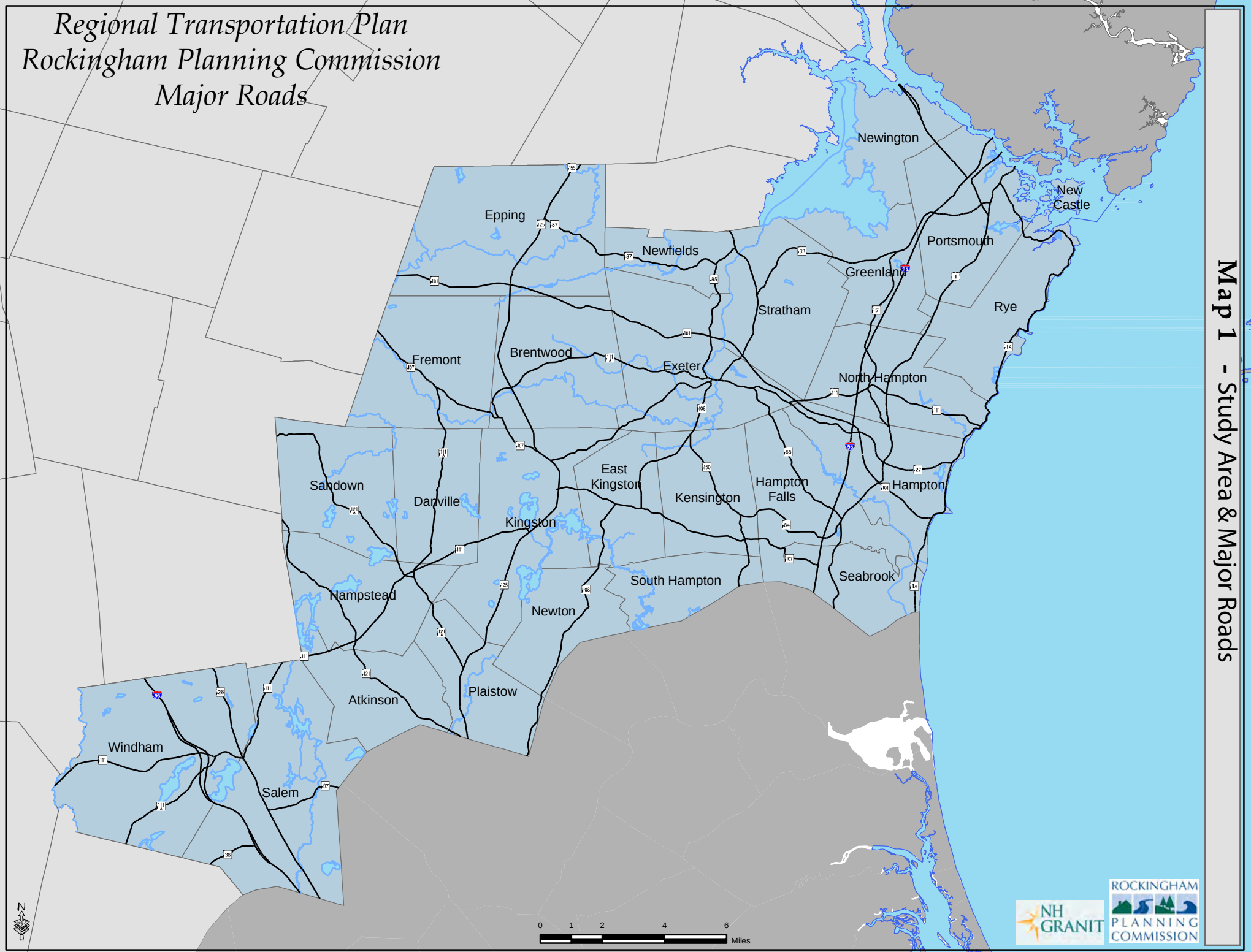

Map 1 - Study Area & Major Roads

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ROCKINGHAM PLANNING COMMISSION

Introduction

The Rockingham Planning Commission region's vitality and the quality of life of its residents depend greatly on the mobility of people and goods, the accessibility of destinations, and in some areas, the provision of public transportation, walking, and cycling as travel options. As one of the more rapidly growing areas of New Hampshire, the 27 community RPC region added approximately 30,000 people and 25,000 jobs between 1990 and 2010, and is expected to add another 40,000 people and 35,000 jobs between 2010 and 2040. This growth, combined with resource constraints, poses a challenge to providing adequate mobility, accessibility, and developing a multimodal transportation system that is addressed in the 2040 Long Range Transportation Plan.

1. Document Purpose and Scope

This component of the document discusses the purpose and scope of the Long Range Transportation Plan, as well as the structure that has been developed for the document.

This Transportation Plan, referred to as the 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***). The Plan contains the region's adopted policies, goals and objectives and specific project proposals to improve the transportation system through the year 2040. It is in compliance with the ***Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users*** (SAFETEA-LU), and the ***Clean Air Act Amendments of 1990*** (CAAA). While new federal transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21) was passed in June 2012, major policies impacting this plan remain largely consistent, and implementing guidance from the Federal Highway Administration (FHWA) is not yet available. This plan was developed as a result of a continuing, cooperative, and comprehensive planning process, which considers all transportation modes and supports metropolitan community development. The plan reflects the goals and objectives of member communities in their own master plans and policies, of the New Hampshire Department of Transportation (NHDOT) in its Long Range Transportation Business Plan, as well as those established by the RPC via the Regional Master Plan and the MPO process.

This plan includes long-range and short-range strategies and addresses a minimum twenty year planning horizon (27 years in this case) as directed by planning standards established in SAFETEA-LU and continued with MAP-21. The responsibilities for carrying out transportation planning are specified in a memorandum of understanding between RPC and the NHDOT as well as between RPC and the Cooperative Alliance for Seacoast Transportation (COAST).

***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
Rye
Salem
Sandown
Seabrook
South Hampton
Stratham
Windham

SAFETEA-LU and MAP-21 include eight planning factors that should be considered in the planning process and during the development and implementation of projects, strategies, and services:

1. Support the economic vitality 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 the accessibility and mobility of people and for freight;
5. Protect and enhance the environment, promote energy conservation, and improve 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; and
8. Emphasize the preservation of the existing transportation system.

The Clean Air Act Amendments of 1990 placed requirements on the transportation planning process designed to ensure that transportation plans and programs developed by MPO's contribute to, and not detract from, the goal of reaching national ambient air quality standards. The law's key mechanism in this regard is to require that all Plans and TIPs adopted by the MPO be found, through a quantitative analysis of the specific projects proposed, to contribute to a reduction in mobile source emissions. All of the RPC communities are included within the Boston-Manchester-Portsmouth (Southeast) New Hampshire moderate ozone nonattainment area under the 8-hour ozone standard (See Appendix A – Air Quality Conformity Analysis). The NHDES, NHDOT and MPOs within the non-attainment area are working cooperatively to demonstrate attainment with the 8-hour Ozone standard by June of 2009 as required by the State Implementation Plan for Air Quality Attainment (SIP). This demonstration must be inclusive of growth in development and automobile VMT occurring in the region. Since mobile source (motor vehicles) accounts for between 55% and 60% of ozone related emissions in New Hampshire, it expected that mobile source emissions reduction will carry a major portion of the burden in reaching attainment. For this reason, the impact of proposed short and long-term changes to the transportation system (as expressed in the Plan and TIP) must be carefully reviewed to ensure they will contribute to emissions reductions. Since the attainment area is shared across four MPOs, air quality conformity review process requires extensive coordination. This review and coordination between agencies occurs via the interagency consultation process which involves periodic meetings of representatives from FHWA, FTA, EPA, NHDOT, NHDES, MPOs and the RPCs to review and discuss projects to help determine air quality impacts, regional significance, and amendment type and status for the TIP. Any changes that will potentially trigger conformity are discussed and explored by the participating agencies through the interagency consultation process allowing potential impacts to be identified early in the revision process.

The governing board for the region's MPO is the Rockingham Planning Commission. The Commission is made up of representatives from the twenty-seven member communities as well as agency representatives from the New Hampshire Department of Transportation (NH DOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Air Resources Division of the

New Hampshire Department of Environmental Resources (NH DES). Also involved in the MPO planning process are representatives from the two regional transit providers; the Cooperative Alliance for Seacoast Transportation (COAST) and the Cooperative Alliance for Regional Transportation (CART), as well as 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).

2. The Planning Process

The Long Range Plan is generally developed by the RPC as illustrated in ***Figure 1.1***. More specifically, the process of developing and approving a Long Range Transportation Plan is illustrated in ***Figure 1.1.*** In accordance with SATETEA-LU and MAP-21, the MPO must review and update the transportation plan at least every four (4) years in air quality non-attainment (and maintenance) 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 10 Year 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

2.1 Public Participation

As required by the MPO Prospectus, in accordance with SAFETEA-LU and MAP-21, the region has adopted and incorporated a process for soliciting public participation during the development of this Plan. This procedure forms the basis for public involvement in all MPO transportation planning efforts, and will be further expanded and improved, as appropriate, to obtain input from a broader spectrum of individuals, groups, and agencies. This includes those 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. To this end, staff implemented a public participation process for the Long Range Transportation Plan update incorporating the following elements:

- A telephone survey of 501 randomly-selected households in the MPO region, conducted by the UNH Survey Center.
- An on-line survey of key MPO stakeholders using the same survey instrument.
- Public forum input in conjunction with NHDOT Long Range Plan development.
- 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.

2.2 Environmental Justice

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, dated February 11, 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 populations. On April 15, 1997, USDOT issued its Final Order to Address Environmental Justice in Minority Populations and Low Income Populations. Among other provisions, the Order requires 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 the 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.

2.3 Current Plan Update Process

The development of this update to the Plan occurred in two phases and began in 2007 after the redesignation of Metropolitan Planning Organization (MPO) boundaries in Southeastern New Hampshire. Phase one of the update merged and reorganized the projects and policies of the RPC communities of the former Seacoast MPO and the former Salem-Plaistow-Windham (SPW) MPO into a single Long Range Plan consistent with RPC boundaries. In addition, phase 1 incorporated provisions required by SAFETEA-LU that had not yet been implemented in the region. These requirements were to include:

a. **Public Participation Program**: A public participation program must be in place that allows for inclusion of input from people representing all modes and other interested parties. A program was approved by both the Seacoast and SPW MPOs in the spring of 2007 and by the RPC in the fall of 2007.

b. **Environmental Mitigation:** A "discussion of types of potential environmental mitigation activities" which is to be developed in consultation with federal, state and tribal wildlife, land management, and regulatory agencies. This does not need to be project specific, but it must be included in the Plan.

c. **Consultation & Consistency:** Consultation "as appropriate" with "State and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation".

d. **Transportation System Security:** This used to be part of the "Safety and Security" planning factor, but is now a stand-alone factor that must be in place prior to MPO and State adoption/approval of transportation plans addressing SAFETEA-LU provisions.

e. **Operations and Management Strategies:** Metropolitan plans shall include operational and management strategies to improve the performance of existing transportation facilities to relieve congestion, and to maximize the safety and mobility of people and goods.

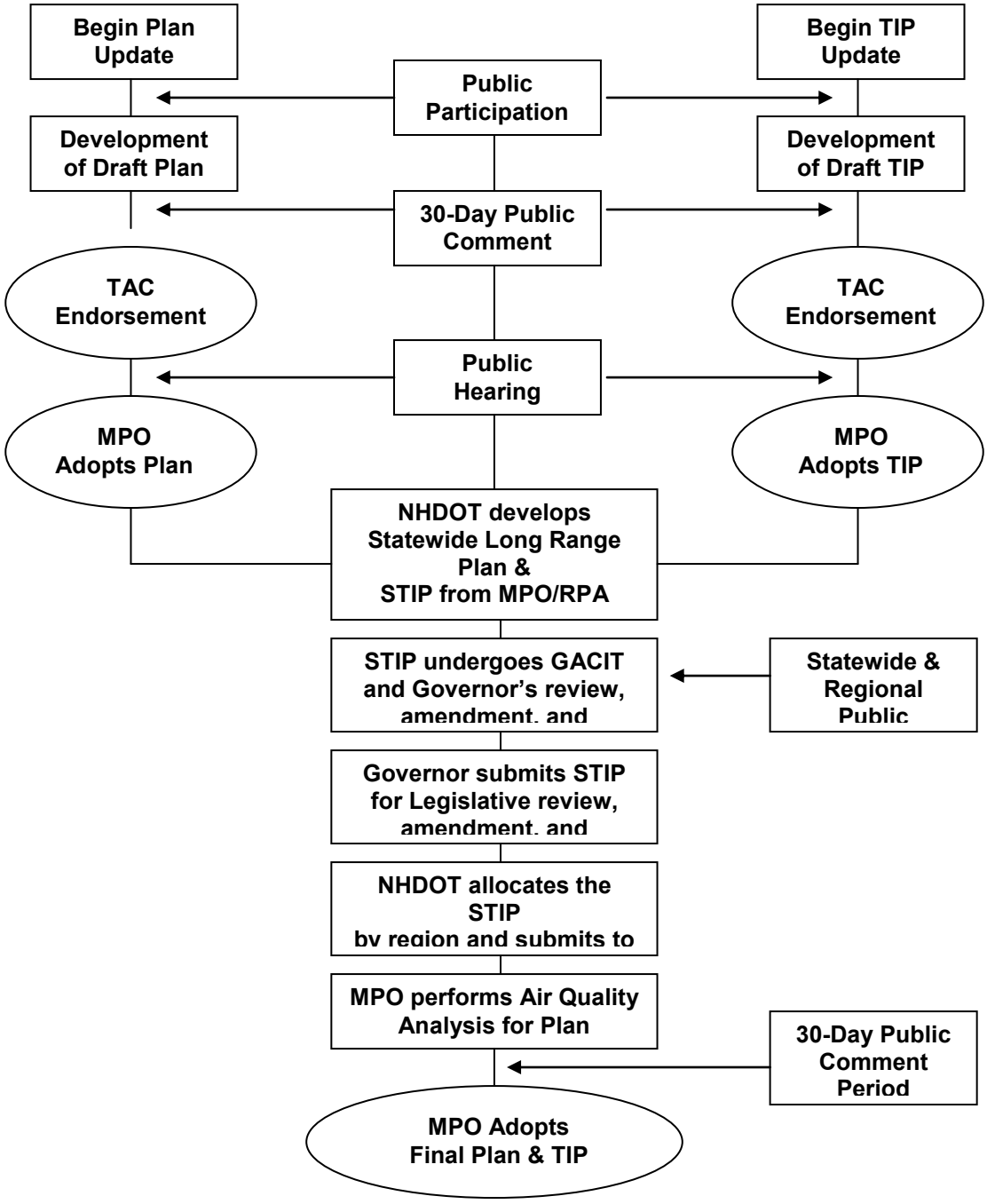
f. **Visualization Techniques:** Appropriate Visualization techniques must be utilized to bring the document to the public for comment. The MPO plans have relied on maps, illustrations, tables, and other figures to help visualize projects and concepts. As the capacity of the agency to diversify and improve the types of visualization that can be done, it will be incorporated into the Plan.

Phase two of the plan update work began in the Fall/Winter of 2007-2008 with the ultimate goal being to restructure the document for easier reading, and further revise and incorporate a number of concepts that have not previously been extensively included in the plan. In addition, SAFETEA-LU requirements would continue to be addressed, as well as improvements to the plan by incorporating the following types of work:

- **Incorporate Performance Measures:** Performance measures are specific criteria that are utilized to track the status of particular aspects of the transportation system (number of accidents, volume-capacity ratio, travel delays, etc…) and the MPO should be using them to assess progress towards goals.
- **Ensure Consistency with State Efforts:** The Long Range Plan should be consistent with changes occurring now regarding Statewide Transportation Planning.
- **Forecasting:** The Long Range Plan should forecast future land use levels, population and employment.
- **Scenario Planning:** Scenario Planning applies different regional growth patterns to land use and determines the impacts on the transportation system from these changes.
- **Improvement Projects:** Data on current project is sometimes incomplete and to fully prioritize projects more information is necessary
- **Financial Plan**: The Financial component of the long range plan ensures that (to the best of our abilities), the Plan is feasible to construct given existing and expected resources**.** There are new requirements coming into effect for this component at the end of the year that will need to be incorporated into the document.

Minor updates to the Plan have been undertaken in 2010 and 2012 to incorporate changes to the Long Range Project List based on the NHDOT 2013-2022 Ten Year Transportation Plan, information on Air Quality Conformity, the 2010 U.S. Census, and preliminary information available on the MAP-21 reauthorization of SAFETEA-LU.

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

3. Contents of the Long Range Plan

The Long Range Plan is composed of both SAFETEA-LU and MAP-21 required elements as well as other components that while not required, help provide a more complete picture of the transportation system and future needs.

3.1 Plan Structure

The Long Range Transportation Plan is organized into four chapters in addition to this introductory section. 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 four chapters are:

Chapter 1: 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 background on existing components of the transportation system, including Highways, Bicycle and Pedestrian Facilities, Public Transportation, Transportation Demand Management, and Freight Transportation facilities and programs.

Chapter 2: Regional Transportation Vision. This chapter establishes the MPO Long Range Transportation Plan Policies and Goals, and provides a context for future transportation system needs based on regional growth and forecasting. A mode based needs assessment estimates necessary improvements for roadways, transit (bus and rail), bicycles and pedestrians, and freight (truck and rail). Scenarios for various growth patterns will demonstrate alternative plans for future development. The region's needs will be projected based on these scenarios.

Chapter 3: 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 SAFETEA-LU. The project listing is organized into the Transportation Improvement Program (TIP) which lists the first four years of projects (2013-2016) and the Plan projects which are the remaining years of 2017 to 2040. This section will also discuss the impacts of the plan concerning Environmental Mitigation, Historic and Cultural Resources, Environmental Justice, Safety, and Security.

Chapter 4: Strategies and Implementation. This chapter discusses a variety of options and methods for implementing and evaluating the Plan on the local, regional, and state-wide levels. Potential Congestion Mitigation Strategies are Access Management, Intelligent Transportation Systems (ITS), Transportation Systems Management (TSM), and Transportation Demand Management (TDM). Implementation Strategies include Access Management Plans, Right of Way Preservation, Design Standards, Context Sensitive Solutions, and strategies for transit, bicycle, and pedestrian travel.

3.2 Required Elements

The ***Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*** of 2005 includes specific requirements for elements to be included in MPO Long Range Plans and how they are developed.

- ***20 Year Horizon***: The Plan must cover a minimum 20 Year timeframe. This plan will cover a somewhat longer 27 year timeframe from 2013 to 2040. This horizon year was worked out in consultation with the other New Hampshire MPOs, NH DOT, NH DES, FHWA, EPA, and FTA and is extended to ensure that the plan does not reduce to less than 20 years in between the planned four year updates.
- ***Long and Short Term Actions***: The Plan must include long and short range actions that lead to the development of an integrated multimodal transportation system. This document includes strategies, policies, and projects that are to be implemented in both the short and long term.
- ***Regular Updates***: The Plan must be reviewed and updated at least every four years in air quality nonattainment areas. Major updates of the plan are scheduled for every four years in conjunction with TIP updates however minor adjustments and amendments to the plan will occur as necessary at other times.
- ***Latest Planning Assumptions:*** The Plan must validate data used in other modal plans and updates must be based on the latest planning assumptions regarding population, employment and other activities. Population and employment projections are based on the latest available information and are consistent with Office of Energy and Planning and Department of Employment Security projections in overall growth levels.
- ***Demand Forecasts:*** The Plan shall include at a minimum, the projected transportation demand in the MPO Region over the plan horizon. The Regional Travel Demand Model has been utilized to estimate travel demand on the roadway network over the life of the plan.
- ***Facilities:*** Existing and proposed transportation facilities that should function as an integrated metropolitan transportation system.
- ***Public Participation Program:*** A public participation program must be in place that allows for inclusion of input from people representing all modes and other interested parties. A program was approved by the Rockingham Planning Commission during the spring of 2008.
- ***Environmental Mitigation:*** A "discussion of types of potential environmental mitigation activities" which is to be developed in consultation with federal, state and tribal wildlife, land management, and regulatory agencies. A discussion of the general types of environmental mitigation available in the region is included in Chapter 3 of this document under the "Plan Impacts and Mitigation" section.
- ***Consultation & Consistency:*** Consultation "as appropriate" with "State and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation". The contents of this plan include reference to state, regional, and local planning efforts, as well as direct consultation with state and local agencies.
- ***Transportation System Security:*** This used to be part of the "Safety and Security" planning factor, but is now a stand-alone factor that must be in place prior to MPO and State

adoption/approval of transportation plans addressing SAFETEA-LU provisions. This has been incorporated into the document where relevant to the region.

- ***Operations and Management Strategies:*** Metropolitan plans shall include operational and management strategies to improve the performance of existing transportation facilities to relieve congestion, and to maximize the safety and mobility of people and goods. This also has been incorporated into the current document where relevant.
- ***Visualization Techniques:*** Appropriate Visualization techniques must be utilized to bring the document to the public for comment. The MPO plans have relied on maps, illustrations, tables, and other figures to help visualize projects and concepts. As the capacity of the agency to diversify and improve the types of visualization that can be done, it will be incorporated into the Plan.
- ***Financial Plan:*** SAFETEA-LU and MAP-21 require that the Long Range Plan include a Financial Plan that "*demonstrates how the adopted transportation plan can be implemented*". The financial component of the long range plan ensures that (to the best of our abilities), the Plan is feasible to construct given existing and expected resources**.** Additional requirements for this component are discussed in Chapter 3 of this document.

3.3 Other Components

In addition to those items required to be included, there are a number of concepts that have not previously been extensively discussed in the past but should be included for completeness.

- ***Performance Measures:*** Performance Measures are specific criteria that are utilized to track the status of particular aspects of the transportation system (number of accidents, volume-capacity ratio, delays, etc…) and are used to assess progress towards goals. The Plan has not previously included any formalized assessment of progress however it is felt that the region would benefit from this process.
- ***Scenario Planning:*** This concept applies different regional land use growth patterns to determine the impacts on the transportation system. The intent is to provide regional decision makers with an understanding of how land use impacts the transportation network and give a general assessment of the impacts of the proposed improvements to the network.
- ***Implementation Strategies:*** Previous plans have included a number of projects and policies, but little if any discussion on how to get many of them implemented. This plan includes management, financial, design, and policy alternatives to that can be used to make higher quality improvements to the transportation network without relying on costly roadway widening.

Chapter 1: Existing Conditions

1. Land Use and Transportation

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.

Sprawl can be defined as the inflation, over time, in the amount of land area consumed <u>per unit</u> of human activity, and in the degree of dispersal between such land areas.

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 is growing faster. 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.[1] This shift is due to a combination of factors including market trends, zoning, and natural constraints on remaining undeveloped land. The dispersed land use pattern it 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. [2]

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. 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. As a result, 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 also means that

[1] Land Use Change: Rockingham County NH 1953-1982. Befort, Luloff, and Morrone, 1987.
[2] RPC & SRPC traffic count data

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.

Map2 portrays existing land use patterns between 1962 and 2005 for the Rockingham Planning Commission region. The data are derived from aerial photographs and are updated on an ongoing basis as part of the MPO work program. Data are non-parcel based and can be classified into as many as 56 categories. For the purposes of this map, these categories were collapsed into two; developed and undeveloped. Developed land includes all commercial, industrial, residential, and mixed use development in the region. Undeveloped land includes all those areas that are not built upon, as well as agricultural uses. Primarily these are areas which are forested, wetlands, conservation lands, and other vacant properties. In addition, there remain a small number of agricultural farms scattered throughout the region and these uses are included in this category. The intent is to be able to show the pattern of growth in the region over time.

This pattern illustrates the classic example of poor 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 1.1***. 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.

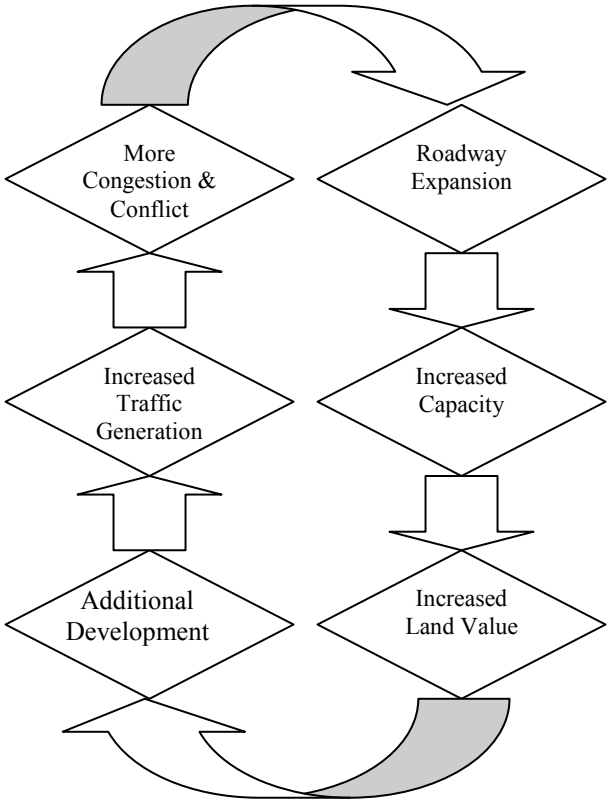
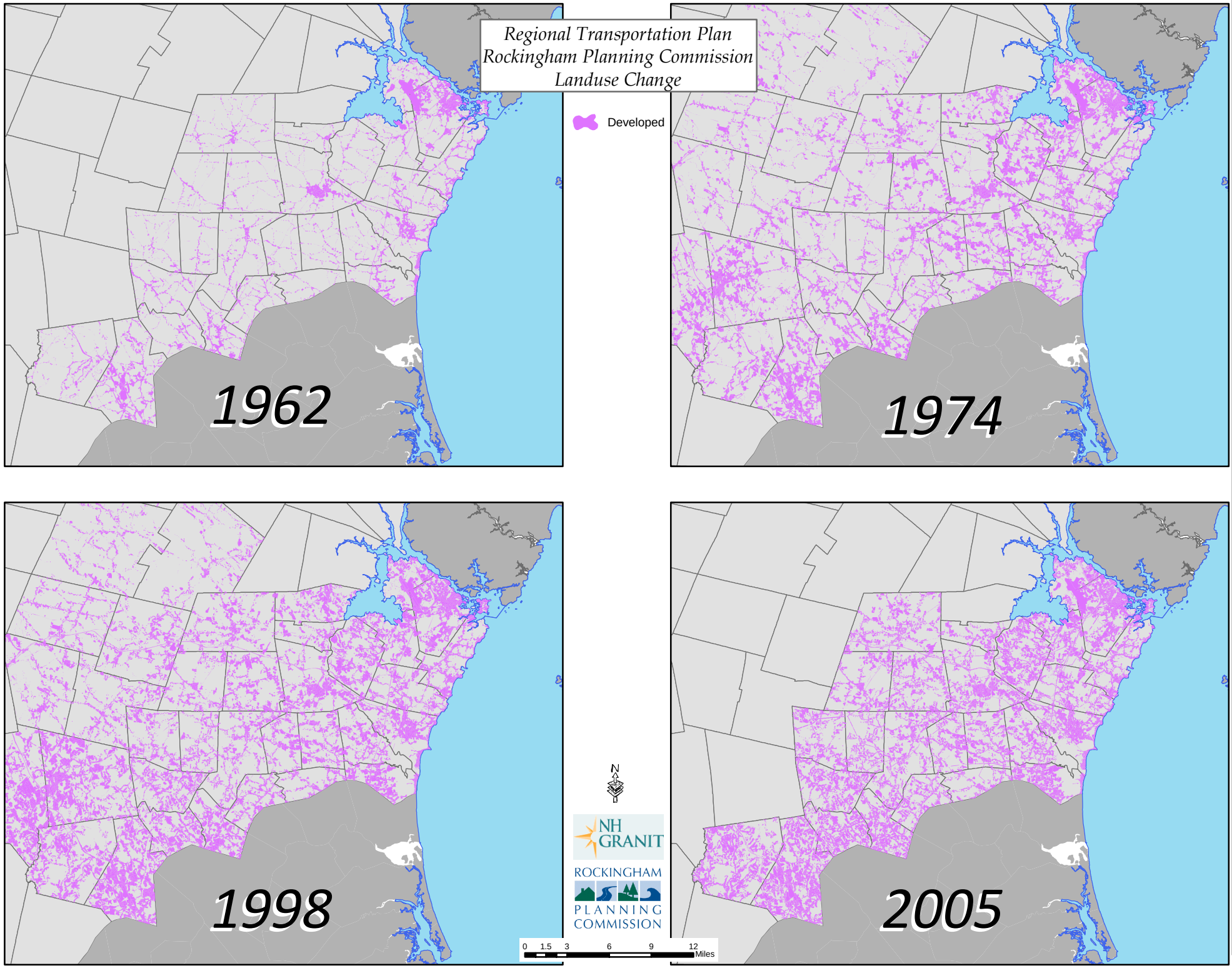


Figure 1.1
The Transportation Land Use Cycle
"...this cycle continues until it is physically or economically impossible to further expand capacity. Access Management together with good land use controls can preserve highway capacity and effectively slow down or halt the cycle."
-- FHWA Access Management Project

Other evidence of this pattern has been the relocation of public facilities such as schools, post offices, or court houses to the outskirts of town where they are inaccessible by foot and difficult to access by bicycle or transit. Policies that discourage housing near job centers, leading to heavy commuter traffic between bedroom communities and job centers, as seen daily on the Little Bay Bridges are also evident.



Map 2 - Landuse Change 1962,1974,1998,2005

2. Population and Housing

From 2000 - 2010 New Hampshire was the fastest growing state in New England. The state grew 6.5% during the decade, while New England as whole grew 3.8%, and the nation 9.7%. Within that, the population of the RPC region has grown from 178,997 in 2000 to 191,975 in 2010, or 7.3%.

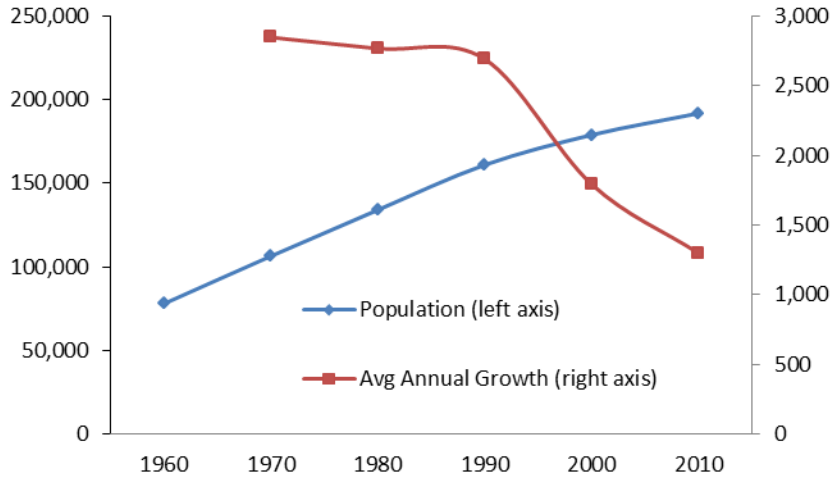
New Hampshire's median age is 39.2, seventh oldest in the nation. The median age in all the New England states is above the national median of 36.2.

2.1 Population Change

During the past two decades, the MPO study area has been one of the fastest growing areas in New Hampshire. Much of this growth can be attributed to the area's proximity to the Boston metropolitan area, and to the substantial growth in employment within the Portsmouth, Salem, and Exeter labor market.

Between 1960 and 2010 the population of the RPC communities grew by over 146%. This rapid and steady population growth is shown in ***Figure 1.2***, and as evidenced by the "building boom" of the early and mid 1980s, and of the strong growth of the early 2000's. The early 1990s were a period of economic recession in the region, where population and employment leveled off, and even declined in some areas, in conjunction with the closure of the Pease Air Force Base, and work force reductions at the Portsmouth Naval Shipyard. Overall, population did increase in the region's communities from 2000 to 2010, although at a much lower rate than previously had been seen, and with several exceptions including New Castle, Newington, Plaistow, and South Hampton. While the average annual growth rate has declined, the population continues to grow. The region as a whole during the 1990s grew at an average rate of 1.2% per year, while average annual growth in the 2000s was 0.8%. Growth rates were much higher in the region's rural communities, with an average annual rate of 2.1% versus 0.7% for urban areas over the same time period.

Figure 1.2: Growth in RPC Region 1960-2010



Another aspect of the population growth in the region with significant implications for the transportation system is the rapid growth of the senior population over age 65. This is due in part to the aging of the baby boom generation, but also due to local policies encouraging age restricted senior housing developments as an approach to broadening tax bases without increasing school costs. Between 2000 and 2010 the population over 65 in Rockingham County grew over 33%, as compared to

overall population growth of 6.4%. This growth in the senior population will continue in the next two decades, driven by the aging of the baby boom generation, as well as in-migration to the region. An implication for the transportation system is that, according to the American Association of Retired Persons (AARP), an estimated 20% of Americans over age 65 do not drive, and require transportation assistance.

Table 1.1: Municipal Population Change – 1960-2010

Municipality	1960	1970	1980	1990	2000	2010	Pop Chg 1960-2010	% Chg 1960-2010
Atkinson	1,017	2,291	4,397	5,188	6,178	6,751	5,734	563.8%
Brentwood	1,072	1,468	2,004	2,590	3,197	4,486	3,414	318.5%
Danville	605	924	1,318	2,534	4,023	4,387	3,782	625.1%
East Kingston	574	838	1,135	1,352	1,784	2,357	1,783	310.6%
Epping	2,006	2,356	3,460	5,162	5,476	6,411	4,405	219.6%
Exeter	7,243	8,892	11,024	12,481	14,058	14,306	7,063	97.5%
Fremont	783	993	1,333	2,576	3,510	4,283	3,500	447.0%
Greenland	1,196	1,784	2,129	2,768	3,208	3,549	2,353	196.7%
Hampstead	1,261	2,401	3,785	6,732	8,297	8,523	7,262	575.9%
Hampton	5,379	8,011	10,493	12,278	14,937	14,976	9,597	178.4%
Hampton Falls	885	1,254	1,372	1,503	1,880	2,236	1,351	152.7%
Kensington	708	1,044	1,322	1,631	1,893	2,124	1,416	200.0%
Kingston	1,672	2,882	4,111	5,591	5,862	6,025	4,353	260.3%
New Castle	823	975	936	840	1,010	968	145	17.6%
Newfields	737	843	817	888	1,551	1,680	943	128.0%
Newington	1,045	798	716	990	775	753	-292	-27.9%
Newton	1,419	1,920	3,068	3,473	4,289	4,603	3,184	224.4%
North Hampton	1,910	3,259	3,425	3,637	4,259	4,301	2,391	125.2%
Plaistow	2,915	4,712	5,609	7,316	7,747	7,609	4,694	161.0%
Portsmouth	26,900	25,717	26,254	25,925	20,784	21,233	-5,667	-21.1%
Rye	3,244	4,083	4,508	4,612	5,182	5,298	2,054	63.3%
Salem	9,210	20,142	24,124	25,746	28,112	28,776	19,566	212.4%
Sandown	366	741	2,057	4,060	5,143	5,986	5,620	1535.5%
Seabrook	2,209	3,053	5,917	6,503	7,934	8,693	6,484	293.5%
South Hampton	443	558	660	740	844	814	371	83.7%
Stratham	1,033	1,512	2,507	4,955	6,355	7,255	6,222	602.3%
Windham	1,317	3,008	5,664	9,000	10,709	13,592	12,275	932.0%
RPC Region	**77,972**	**106,459**	**134,145**	**161,071**	**178,997**	**191,975**	**114,003**	**146.2%**

Sources: U.S. Census 1960-2010

2.2 Employment and Commuting Patterns

New Hampshire's labor force participation rate is above the national average, but has declined in recent years. As the state transitions from Baby Boomers to Generation X (born from 1964 to 1980) and then to the larger Boomer Echo or Millennial Generation (born from 1981 to 2000) the participation rate will reflect these shifts. As the Boomers retire and the Echo Boomers are not yet old enough to work, the labor force participation rate will decrease. As the Echo Boomers enter the work force the rate will increase again.

Since 1990, employment in the Rockingham Planning Commission region has increased by almost 33% (***Table 1.2***), as long time employment centers such as Portsmouth, Exeter, and Salem continue to grow

and other communities such as Brentwood, Epping, Plaistow, Seabrook, Stratham, and Windham showed significant employment gains. A few communities lost employment, most notably Newington which was significantly affected by the closure of Pease Air Force Base in the early 1990s and has never fully regained those employment levels.

As of fall 2012, the 2000 Census remains the most current source of data on commute trips at the town level in the RPC region. The 2010 Census did not include journey to work questions. Instead these are now addressed in the Census' American Community Survey, a small sample annual survey. A five year compilation of ACS data from 2006-2010 is anticipated in late 2012 which should provide an update to the 2000 data .

Analyzing regional commuting data from the 1990 Census Transportation Planning Package (CTPP) and the 2000 CTPP shows some evidence of these shifting patterns. The data are provided in ***Tables 1.4 and 1.5*** respectively. Although work trips make up only 10% of daily person trips during peak commute hours[3], this increment often makes the difference in straining the capacity of our transportation system.

Table 1.2 Community Employment Change (1990-2010)

Community	1990 Employment	2000 Employment	2010 Employment	Total Change	% Change
Atkinson	933	754	966	33	3.5%
Brentwood	333	1,589	1894	1561	468.8%
Danville	132	127	160	28	21.2%
East Kingston	125	189	191	66	52.8%
Epping	749	840	2344	1595	213.0%
Exeter	7,849	8232	9613	1719	21.8%
Fremont	326	289	496	170	52.1%
Greenland	1,955	1412	2085	130	6.6%
Hampstead	1,312	2260	2171	859	65.5%
Hampton	5,684	6920	5447	-237	-4.2%
Hampton Falls	617	491	366	-251	-40.7%
Kensington	260	290	266	6	2.3%
Kingston	1,053	1380	1440	387	36.8%
New Castle	135	106	327	192	142.2%
Newfields	789	908	641	-148	-18.8%
Newington	5,654	5356	4369	-1285	-22.7%
Newton	215	288	469	254	118.1%
North Hampton	1,570	2138	2386	816	52.0%
Plaistow	3,322	4222	4598	1276	38.4%
Portsmouth	18,986	28827	27787	8801	46.4%
Rye	832	1352	1251	419	50.4%
Salem	15,686	21161	19529	3843	24.5%
Sandown	138	129	256	118	85.5%
Seabrook	4,515	5204	5747	1232	27.3%
South Hampton	96	113	107	11	11.5%
Stratham	1,618	2779	3722	2104	130.0%
Windham	1,565	1884	3043	1478	94.4%
RPC Region	**76,494**	**99,240**	**101671**	25177	32.9%

A total of 94,887 residents of the MPO region provided information to US Census regarding the location where they live and work in 2000. The following are some key findings related to trends in commuting patterns in the region between 1990 and 2000.

- *The bulk of workers commute to jobs in New Hampshire* (62,697, or 64%), with most of those (54,277 or 55%) working within Rockingham County employment centers such as Exeter, Hampton, Portsmouth, and Salem. Many of the remaining works commuted to nearby employment centers in Manchester, Concord, and Dover.
- *At a state level, Massachusetts is the second highest commuter destination for residents in the MPO.* Roughly 29,918 or 30.6% commute to Massachusetts. Maine follows with 1,354 (1.4%) residents commuting to that state.

[3] 1995 Nationwide Personal Transportation Survey, FHWA

- *The number of commuters grew at a comparable rate to the increase in population during the 1990s*. Commute trips by residents increased by 10.2% or 8,806 between 1990 and 2000. Population increased by 11.1%, or 17,923 people, during the same period.
- *Commutes within NH and to MA communities have increased, while commutes to Maine have decreased for the MPO region*. Commuters within NH rose by 7,873 or 14.4% compared to 1990 levels and MA rose by 1,863 or 6.6%. Comparatively, commuters from MPO region to Maine decreased by 930 or 40.7%. This decrease can be attributed largely to layoffs at the Portsmouth Naval Shipyard in Kittery, ME through the 1990's.
- *Commutes to Suffolk and Middlesex Counties in Massachusetts increased*. Together these two counties account for much of the Boston Metro area. Commute trips to Suffolk county increase by 11.4% or 290 trips and Middlesex County increased by 20.2% or 1,475 trips. Commutes to Essex County, covering most of northeastern Massachusetts, decreased slightly by 0.9% or 165 trips.
- *There was a significant increase in commute trips to NH locations outside of the MPO region*. The two areas to see the largest percent increase include Merrimack County, with 492 commuters (102%) and Hillsborough County, with 1258 commuters (39%). These increases can be attributed to the upgrades to NH 101 which have made commuting to those areas much quicker than in the past.
- *The decline in commute trips within Portsmouth and Newington reflects closure of Pease*. During 1990-2000, commuters from Newington decreased by 157 (34%) and Portsmouth decreased by 2,433 (21%).
- *There was a growth of commuters in rural communities,* with Danville, East Kingston, Fremont and Newfields all experiencing over 40% increase. Hampton saw the largest gross increase of 1,227 commuters.
- *Five of the top 10 commutes in the RPC region are within the same community.* **Table 1.3** shows Portsmouth, Salem, Exeter, Hampton, and Seabrook as the top destinations within the region for workers who live in those communities. The remaining top destinations are to locations in North-eastern Massachusetts.

Table 1.3: Top 10 Commutes in 2000 (Residents in MPO)

Rank	Residence	Work Location	# of Commuters
1	Portsmouth	Portsmouth	5,982
2	Salem	Salem	4,487
3	Salem	Essex County (MA)	4,137
4	Salem	Middlesex County (MA)	2,601
5	Exeter	Exeter	2,518
6	Hampton	Hampton	1,991
7	Plaistow	Essex County (MA)	1,543
8	Seabrook	Seabrook	1,397
9	Seabrook	Essex County (MA)	1,284
10	Atkinson	Essex County (MA)	1,236

Source: US Census Bureau, 2000

Table 1.4: Commuter Flow – 1990 (Residents in MPO)

Town of Residence	DESTINATIONS																		
	Total	By State				In Rockingham County					Counties								
											NH				MA			ME	
	Total	NH	MA	ME	Other	Derry/ Londonderry	Exeter/Hampton/ Seabrook	Plaistow/Salem/ Windham	Portsmouth/ Newington	Other	Rockingham Co.	Strafford Co.	Merrimack Co.	Hillsborough Co.	Suffolk Co.	Middlesex Co.	Essex Co.	York Co.	Other
Urbanized																			
Epping	2,610	2,081	450	53	26	23	382	100	122	1,084	1,711	137	49	170	48	83	313	38	61
Exeter	6,480	5,171	1,110	147	52	8	2,681	122	668	1,034	4,513	366	66	207	168	239	646	123	152
Greenland	1,617	1,334	147	124	12	6	153	8	526	507	1,200	97	7	30	30	25	72	119	37
Hampton	6,559	4,594	1,654	225	86	8	2,267	32	1,142	680	4,129	191	37	231	243	338	1,017	178	195
Hampton Falls	758	575	167	9	7	-	214	22	69	231	536	15	7	17	25	16	114	9	19
New Castle	416	370	12	24	10	-	17	-	140	194	351	6	4	9	4	-	2	19	21
Newfields	443	364	61	18	0	2	121	1	36	164	324	38	-	2	8	10	41	18	2
Newington	618	552	29	32	5	-	13	-	444	29	486	58	-	8	-	11	11	30	14
North Hampton	2,043	1,644	289	67	43	13	448	-	413	687	1,561	41	-	36	49	43	184	54	75
Plaistow	4,004	1,683	2,312	-	9	23	67	1,172	7	231	1,500	43	22	118	129	440	1,705	-	47
Portsmouth	14,210	12,005	797	1,149	259	39	610	30	9,148	1,015	10,842	954	49	141	143	198	352	1,021	510
Rye	2,517	2,124	184	140	69	20	200	23	957	710	1,910	180	8	26	47	23	98	130	95
Salem	14,095	5,982	8,019	26	68	302	19	4,663	77	185	5,246	41	74	599	508	2,584	4,673	20	350
Seabrook	3,207	1,802	1,359	46	0	8	1,415	34	137	132	1,726	16	6	54	149	167	1,016	25	48
Stratham	2,630	1,958	542	83	47	-	506	22	525	647	1,700	159	12	77	95	120	335	73	59
Windham	4,726	2,459	2,149	9	109	325	10	1,382	24	29	1,770	7	27	631	323	947	822	-	199
Sub-total	66,933	44,698	19,281	2,152	802	777	9,123	7,611	14,435	7,559	39,505	2,349	368	2,356	1,969	5,244	11,401	1,857	1,884

Table 1.4: Commuter Flow – 1990 (Residents in MPO)

Town of Residence	DESTINATIONS																			
	Total	By State				In Rockingham County					Counties									
											NH				MA			ME		
	Total	NH	MA	ME	Other	Derry/ Londonderry	Exeter/Hampton/ Seabrook	Plaistow/Salem/ Windham	Portsmouth/ Newington	Other	Rockingham Co.	Strafford Co.	Merrimack Co.	Hillsborough Co.	Suffolk Co.	Middlesex Co.	Essex Co.	York Co.	Other
Non-Urbanized																				
Atkinson	2,890	1,316	1,566	-	8	26	49	681	11	391	1,158	12	17	129	85	371	1,057	-	61
Brentwood	1,170	919	230	13	8	8	266	60	78	408	820	56	2	37	29	60	136	8	22
Danville	1,351	689	636	9	17	23	27	209	12	322	593	14	12	61	46	153	432	9	31
East Kingston	678	457	207	9	5	-	120	36	44	200	400	32	3	20	10	42	150	9	12
Fremont	1,359	906	430	15	8	35	125	106	51	427	744	26	18	118	19	84	321	13	16
Hampstead	3,554	1,771	1,770	-	13	125	24	488	33	800	1,470	17	33	251	104	521	1,138	-	20
Kensington	833	569	221	30	13	2	183	13	58	270	526	22	9	12	35	30	154	24	21
Kingston	2,920	1,522	1,351	36	11	41	205	268	70	781	1,365	67	10	69	87	272	973	25	52
Newton	1,819	636	1,151	7	25	8	64	167	6	345	590	6	-	26	86	206	853	-	52
Sandown	2,207	1,224	977	6	0	182	49	398	-	427	1,056	6	6	156	49	305	610	6	13
S. Hampton	367	117	235	7	8	-	17	-	22	68	107	4	-	-	31	20	182	5	18
Sub-total	19,148	10,126	8,774	132	116	450	1,129	2,426	385	4,439	8,829	262	110	879	581	2,064	6,006	99	318
MPO Region	86,081	54,824	28,055	2,284	918	1,227	10,252	10,037	14,820	11,998	48,334	2,611	478	3,235	2,550	7,308	17,407	1,956	2,202

Source: US Census Bureau 1990

Table 1.5: Commuter Flow – 2000 (Residents in MPO)

Town of Residence	DESTINATIONS																		
	Total	By State				In Rockingham County					Counties								
											NH				MA			ME	
	Total	NH	MA	ME	Other	Derry/ Londonderry	Exeter/Hampton/ Seabrook	Plaistow/Salem/ Windham	Portsmouth/ Newington	Other	Rockingham Co.	Strafford Co.	Merrimack Co.	Hillsborough Co.	Suffolk Co.	Middlesex Co.	Essex Co.	York Co.	Other
Urbanized																			
Epping	3,038	2,593	397	36	12	98	387	79	272	1,332	2,168	119	60	216	-	125	267	32	51
Exeter	7,322	6,078	1,136	56	52	108	3,073	251	769	1,303	5,504	298	53	193	137	303	636	39	159
Greenland	1,698	1,522	129	35	12	-	201	30	649	484	1,364	103	16	39	30	26	68	35	17
Hampton	7,786	5,735	1,842	74	135	74	2,834	189	1,040	1,030	5,167	184	119	227	307	576	881	47	278
Hampton Falls	979	681	258	27	13	4	265	18	60	283	630	19	10	22	45	75	128	27	23
New Castle	452	381	35	18	18	3	27	1	187	105	323	29	12	15	10	22	3	18	20
Newfields	804	684	92	22	6	8	158	12	103	289	570	54	17	41	15	28	47	20	12
Newington	461	401	20	27	13	14	30	8	208	78	338	52	5	-	3	8	6	32	17
North Hampton	2,260	1,866	350	44	-	34	555	51	435	654	1,729	69	6	62	118	55	154	38	29
Plaistow	4,181	1,770	2,389	7	15	22	96	1,084	109	247	1,558	51	-	161	129	679	1,543	7	53
Portsmouth	11,777	9,885	1,040	686	166	172	817	151	6,361	1,070	8,571	900	168	206	245	335	445	613	294
Rye	2,316	1,832	297	94	93	71	198	32	479	842	1,622	147	7	56	56	54	183	58	133
Salem	14,850	7,209	7,528	27	86	381	191	4,938	193	515	6,218	55	70	814	528	2,601	4,137	27	400
Seabrook	4,330	2,600	1,697	14	19	5	1,787	106	260	300	2,458	66	42	34	115	258	1,284	7	66
Stratham	3,120	2,579	408	97	36	64	568	48	730	870	2,280	171	43	78	24	155	192	44	133
Windham	5,579	2,973	2,555	9	42	398	36	1,450	41	84	2,009	18	103	818	293	1,180	915	-	243
Sub-total	70,953	48,789	20,173	1,273	718	1,456	11,223	8,448	11,896	9,486	42,509	2,335	731	2,982	2,055	6,480	10,889	1,044	1,928

Table 1.5: Commuter Flow – 2000 (Residents in MPO)

Town of Residence	DESTINATIONS																		
	Total	By State				In Rockingham County					Counties								
											NH				MA			ME	
	Total	NH	MA	ME	Other	Derry/ Londonderry	Exeter/Hampton/ Seabrook	Plaistow/Salem/ Windham	Portsmouth/ Newington	Other	Rockingham Co.	Strafford Co.	Merrimack Co.	Hillsborough Co.	Suffolk Co.	Middlesex Co.	Essex Co.	York Co.	Other
Non- Urbanized																			
Atkinson	3,422	1,524	1,836	-	62	51	93	478	78	579	1,279	8	35	194	84	464	1,236	-	122
Brentwood	1,392	1,120	250	22	-	46	358	51	71	443	969	53	36	54	23	61	163	9	24
Danville	2,176	1,313	843	-	20	54	84	342	44	611	1,135	27	18	115	74	237	503	-	67
East Kingston	961	588	359	10	4	8	128	42	59	273	510	15	8	55	34	67	246	10	16
Fremont	1,982	1,331	615	25	11	80	222	132	70	581	1,085	38	16	183	56	97	441	25	41
Hampstead	4,308	2,402	1,874	-	32	258	145	658	106	800	1,967	39	60	329	194	507	1,149	-	63
Kensington	1,013	610	379	9	15	12	224	21	47	254	558	22	8	20	38	99	230	8	30
Kingston	3,124	2,027	1,063	8	26	58	386	300	111	941	1,796	72	23	126	111	303	587	8	98
Newton	2,365	1,007	1,343	5	10	30	126	236	65	438	895	21	27	64	120	259	925	-	54
Sandown	2,739	1,787	936	-	16	153	120	395	59	665	1,392	7	6	362	36	177	668	-	91
S. Hampton	452	199	247	2	4	-	55	8	16	103	182	4	2	9	15	32	195	2	11
Sub-total	23,934	13,908	9,745	81	200	750	1,941	2,663	726	5,688	11,768	306	239	1,511	785	2,303	6,343	62	617
MPO Region	94,887	62,697	29,918	1,354	918	2,206	13,164	11,111	12,622	15,174	54,277	2,641	970	4,493	2,840	8,783	17,232	1,106	2,545

Source: US Census Bureau 2000

2.3 Recent Progress

Many areas of the country have developed innovative approaches to integrating transportation and land use planning to address these problems. In the last several years these approaches have been grouped under the moniker of "Smart Growth." In recent years the Office of Energy and Planning, Regional Planning Commissions, and some New Hampshire communities have begun advocating and experimenting with measures such as access management, mixed use and multi-density development, street connectivity standards, integrated bicycle and pedestrian facilities, context sensitive design, and other techniques that better link transportation and land use planning. While land use planning is not the primary mission of the MPO, the MPO is tightly linked with the Rockingham Planning Commission, and includes officials from member towns with input into both land use and transportation policies. The following chapter discusses current practices in integrating land use and transportation planning in the state, new approaches that are beginning to take hold, and MPO and regional planning policies supporting more integrated planning.

The principles outlined above draw on a number of planning studies carried out around the state in recent years analyzing the disconnect between transportation and land use planning. These include the following:

- Route 16 Corridor Study, RPC and Herr and James Associates, Planning Consultants. This project used a series of case studies to examine the Land Use/Transportation "Dynamic" in the NH Route 16 corridor, with a goal of developing a protection plan for the highway that balanced its role as transportation corridor and economic engine for the region. The study concluded that sprawling development patterns accelerate traffic congestion, and that we cannot build our way out of congestion through continuous roadway expansion. Rather, the key lies in changing land use policy and the study defined three future land use principles for Route 16:
    1. Encourage compact "nodal" development in defined areas that can be well served by the transportation system;
    2. Discourage major new development along state highways between nodes through limiting commercial zoning districts; and
    3. Manage access to highways for new and existing development.
- Managing Growth in New Hampshire: Changes & Challenges, New Hampshire Office of Energy and Planning. This project assessed how growth trends are affecting land development patterns in NH, and ways in which state and local policies and investments induce sprawl. It analyzed a range of statewide growth indicators, municipal case studies, and approaches used by other states to address problems associated with sprawl development. The report offered a series of recommendations to strengthen the ability of state and local governments and regional organizations to cope with the challenges of future growth. Among these were updating state planning statutes to give local governments greater flexibility in planning and zoning; improving and strengthening the role of regional planning agencies; expanding multimodal transportation options; and coordinating regional land use planning with state transportation programs.
- Model Memorandum of Understanding (MOU) on Access Management between NHDOT, MPOs, and Municipalities. The MOU provides model language for agreements between municipalities and NHDOT to collaborate on development and implementation of local access management standards

and site and parcel level access management plans. The MOU provides for communication between DOT and towns in the review or driveway permit applications on state highways. Once signed by towns and the NHDOT, these memoranda will be effective tools in addressing access management issues identified in the Route 1 corridor study.

- I-93 Community Technical Assistance Program: This program is a comprehensive growth management initiative by the NH Department of Transportation to support the region of 26 communities in the area impacted by the reconstruction and widening of Interstate 93 between Salem and Manchester. The program is designed to provide technical assistance to these communities on sound land-use planning practices to minimize the unplanned and negative effects of growth on community services, remaining open space, schools, existing traffic patterns, quality of the environment, and existing residential and commercial zones. Extensive information is available at http://www.nhctap.com/ regarding the program.
- RPC Regional Master Plan: During 2002, the Rockingham Planning Commission updated the Future Land Use chapter of the RPC Regional Master Plan. This was done as part of an overall effort by RPC to incorporate sustainable development principles into regional planning policies. The new chapter sets out a series of principles for future land development in the region that seek to address the problems just described. While not all are explicitly transportation related, all have implications for transportation planning, and encourage development that can be more readily served by multiple modes of transportation. Ultimately, this will offer residents greater choice in how they get where they need to go, and how they live their lives. The following basic principles set forth in the RPC Regional Master Plan area supported by the MPO:

    1. *Guide growth into areas with existing infrastructure (including roads) and away from undeveloped areas, and make adequate public investment in infrastructure to support additional growth.*
    2. *Encourage settlement patterns that employ mixed use, compact design and reduce the rate of land consumption for new development.*
    3. *Favor the reuse of land and buildings for redevelopment over the development of vacant undeveloped land.*
    4. *Create large contiguous areas of open space, farmland, river corridors and critical environmental areas, and establish connections between these areas.*
    5. *Ensure an adequate and affordable housing supply to meet the needs of the region's workforce, young families and the elderly.*
    6. *Foster downtowns, village centers and neighborhoods which preserve historic buildings and community character and promote good design.*
    7. *Encourage settlement patterns that can be efficiently served by multiple nodes of transportation, including pedestrians and bicycles.*

These studies and policy initiatives have done much to raise awareness at the state and local level of the need to better integrate transportation and land use planning; and to provide innovate tools to municipalities to achieve that integration. Much work remains to be done to improve regional cooperation, encourage adoption of innovative land use policies at the local level, provide technical assistance to communities, and improve multimodal transportation options throughout the region. The MPO can and should play a strong advocacy and educational role in moving these initiatives forward at the state level and within member communities.

2.4 Issues and problem areas

The interrelationship between population growth, employment patterns and land use ultimately affects transportation patterns and frequency. Consistent with national trends, vehicle miles traveled and total vehicle trips have increased at rates that are two to three times faster than either population or housing growth. The projected growth across the rural communities in the study area, and the likelihood of continued dispersed land use, ensures that transportation planners must expect a disproportionate rise in the demand for travel in the region for the foreseeable future.

Local Zoning: Local land use regulations which prohibit mixed use development and encourage widespread 2 acre residential zoning, create a sprawling development pattern which leads to the problems discussed earlier in this section. This separation of land uses came about largely in the 1940s-50s with the spread of the automobile. It is a departure from the traditional New England village, where houses were often spaced close together, and in close proximity to commercial areas where residents needed to go for goods and services.

Communications: Another factor is the disconnect between local and NHDOT driveway permitting policies. Historically, NHDOT and municipalities have not communicated or coordinated effectively in reviewing applications for driveway permits on state highways. Towns often do not comment on NHDOT driveway permit applications forwarded to them by the Department. Consequently, permits are often granted without adequate consideration of the impacts of additional traffic generation and turning movements on road capacity and safety.

Expertise: Beyond improving communication with NHDOT, another key issue is lack of experience on the part of local planning boards in making the link between site plan applications and broader growth implications including traffic impacts. Planning boards, particularly in smaller communities, often lack experience in evaluating traffic impacts of development projects. This includes lack expertise in critically evaluating traffic impact analysis studies submitted by developers or adequate consideration of the traffic impacts of different types of land uses during the preparation of local Master Plans and zoning ordinances. The planning commissions' annual municipal board training series is one opportunity to provide some of this training sharing technical expertise through a combination of written materials, training workshops, and direct technical assistance is also an appropriate role for the RPC.

Taxation & the Jobs/Housing Imbalance: The region's housing imbalance is linked in part to New Hampshire's reliance on property taxes to support schools and other public services. Towns seek to attract commercial development, because it is perceived as preferable to residential development in contributing more to the tax base as it withdraws in services such as schooling costs. Housing, particularly moderately priced housing, generally contributes less to the tax base than the cost of schooling the children that live in the houses. This creates a disincentive for residential development.

3. Transportation Network

This portion of the document will discuss the various aspects of the existing transportation network within the Rockingham Planning Commission region as well as connections to surrounding areas.

3.1 Highways

By providing access to land, the transportation system has a tremendous impact on the physical settlement patterns of a region, and in New Hampshire, that has been defined almost solely by the extent of the roadway network. Traditionally, the greatest emphasis has been placed on expansion of the capacity of the existing highway system and this is reflected in the ***1900 miles*** of well developed state and local roads (***Table 1.6***) that provide access to the land in the region. There are some deficiencies in the network that have become more apparent as population growth has pushed development further and further from town centers and placed larger traffic and maintenance burdens on secondary state highways and local roads. Major regional highways are shown on ***Map 1***.

Interregional Routes

There is a backbone of transportation routes that carry the majority of long distance travel both within and to and from the region. These routes carry the highest volumes of people and goods between the communities and the regional employment and other activity centers. These routes tend to be on the National Highway System (NHS) and are made up of Interstate Highways, Expressways, and other Principal Arterials. These roadways in the RPC are:

Interstate 95 (I-95) is an eight lane, toll facility that crosses the southeastern portion of the RPC between Massachusetts and Maine. The route serves as a major commuter transport corridor in the region, as well as handling year round tourist traffic between southern and northern coastal New England and the Maritime Provinces of Canada. Because of the tourist traffic, volumes on the roadway vary significantly by time of year from an average of 69,000 (2008) vehicles per day in the winter, to 129,000 (2007) vehicles on an average weekend day at the peak of summer traffic in August.

Interstate 93 (I-93), a grade-separated freeway, is located in the western part of the region and runs north/south from Massachusetts through Salem and Windham and north to Manchester, Concord, and northern New Hampshire. The Average Daily Traffic (ADT) ranged from approximately 108,000 at the NH-MA state line to approximately 72,000 at the Derry- Windham town line in 2008. Interstate 93 is currently scheduled to undergo a widening to 4 lanes in each direction from exit 1 north through Exit 3. Interchanges and bridges will also be reconfiguration and reconstructed and Park and Rides constructed at Exits 2, 3, 4, and 5, transit service along the corridor, and technical assistance to communities (CTAP) impacted by growth due to the project. Plans also extend the widening north to Manchester (3 lanes in each direction), however limited funding has put this portion of the project on hold at this time.

NH 101 is the region's major east-west highway and in the past was a high traffic and high accident corridor. A major upgrade was completed in 2001, completing the current grade separated, four-lane facility connecting Interstate 93 in Manchester with Interstate 95 in Hampton. East of the interchange with Interstate 95, NH 101 reduces to two lanes until its end at Route 1A in Hampton. The transformation of this roadway has reduced the number and severity of some types of accidents (head-on collisions for instance), but has also seen a significant increase in traffic. According to the permanent

counter located in eastern Exeter, the adjusted average daily traffic was 33,500 at the completion of construction (2001). By 2007 this had grown to 41,000 showing a 5% per year average growth rate.

NH 16, also known as the ***Spaulding Turnpike***, is a north-south, limited access toll roadway which carries commuter and tourist traffic, and serves as a gateway from the Seacoast to the Lakes Region. ADTs on NH 16 are approximately 70,000 vehicles per day (2007) at the Little Bay Bridges between Newington and Dover. This facility is scheduled to be improved between Exits 3 and 6 by widening the bridges and roadway to 4 lanes in each direction, and reconfiguring the interchanges. Additional work will occur on connecting roadways to improve traffic flow on and off of the highway.

NH 125 is primarily a 2 lane roadway that carries traffic from Massachusetts through Plaistow, Kingston, Brentwood and Epping where it exits the RPC region. The road connects I-495 to NH 111, NH 101, and further north to US Route 4, and Route 16 (Spaulding Turnpike) and into Maine. Except for short four lane sections near the Massachusetts border and around NH 101, NH 125 is a two lane roadway with ADTs that range from 25,000 (2005) at the border, to approximately 15,000 (2006) in Kingston, and 24,000 vehicles per day north of NH 101 in Epping. NH 125 is being improved in Plaistow and Kingston by widening, adding traffic signals, and making other intersection improvements, and implementing access management policies. A study of the corridor from Epping to Rochester was recently completed

Table 1.6: Road Mileage by Functional Class and Maintenance Responsibility

		Maintenance					
Class #	Functional Classification	State	Local	Private	Not Maintained	Total	State Routes
0	Non-Public Roads			266.91	50.001	316.911	none
1	Rural Principal Art - Interstate	14.102				14.102	93, 95
2	Rural Principal Art - Other	35.619				35.619	101, 107, 111, 125
6	Rural Minor Arterial	5.365	0.66			6.025	1, 27, 33, 108
7	Rural Major Collector	38.112				38.112	1A, 28, 85, 107, 108, 111, 121, 150, 111A, 121A
8	Rural Minor Collector	44.165	2.077			46.242	27, 84, 85, 87, 88, 107, 108, 151, 155, 107A, 111A
9	Rural Local Road	25.328	309.228			334.556	101 Interchanges, Winnicut Rd, Nimble Hill Rd, Academy Ave.
11	Urban Principal Art - Interstate	36.52				36.52	93, 95
12	Urban Principal Art - Other Freeways and Expressways	22.999				22.999	4, 1B, 101
14	Urban Principal Art - Other	35.393	7.096			42.489	1, 28, 101, 107, 111, 125
16	Urban Minor Arterial	56.318	41.553			97.871	1, 1A, 1B, 27, 28, 33, 38, 84, 97, 107, 108, 111, 121, 128, 101E, 121A
17	Urban Collector	74.663	48.84			123.503	1A, 27, 38, 85, 87, 88, 107, 108, 111, 128, 151, 286, 111A, 121A
19	Urban Local Road	53.877	738.65			792.527	101, 93, and 95 Interchanges, Bayside Rd, Rockingham Blvd
	Total Mileage	442.461	1148.104	266.91	50.001	1907.476	

Data from NH DOT 2008 Roads Database

with extensive recommendations for improvements in Epping that would widen the roadway to 5 lanes and reconfigure traffic signals along the route. A study of the Brentwood portion of the corridor will start in 2008.

Interstate 495, although outside of the RPC region, is an important facility which follows an east-west path through the center of the adjacent Merrimack Valley Region. The highway forms an "outer belt" around the Boston Metropolitan area and provides access between highways in the area such as Routes 28, 97 and 125, as well as an east-west connection between Interstates 93 and 95.

Regional Routes

In addition to the set of interregional roadways, there is a larger set of State secondary and local roadways that carry more localized traffic between the communities. These roadways tend to carry lower volumes of traffic on shorter trips. The more important of these within the RPC region are:

US 1 is a heavily developed two lane roadway for most of its length that provides local connections to communities along the seacoast, access to NH beaches for tourists, as well as high levels of commercial activity. Traffic volumes vary greatly depending on location and range from 13,000-26,000 (2006). Volumes stay above 20,000 vehicles per day through much of the area between Seabrook and Hampton, and drop off in North Hampton and Rye to the 15,000-18,000 range. Volumes grow again as you enter Portsmouth until the split for the US 1 Bypass which connects again to Interstate 95, the Spaulding Turnpike, as well as continuing to Maine via the Sarah Long Bridge. US 1 itself continues through Portsmouth, and crosses to Maine via the Memorial Bridge. Projects are underway to rehabilitate the Memorial Bridge as well as the bridges along the US 1 Bypass.

NH 1A is a two lane coastal roadway, which was recently designated as a New Hampshire Scenic Byway. Much of the roadway is commercialized and in the summer are congested with both motorized and non-motorized beach traffic. ADTs range from 11,700 in Seabrook to 8,000 in New Castle.

NHDOT's Traffic Research section *monitors traffic growth throughout the state and publishes monthly Automatic Traffic Recorder Reports for 79 locations, and an annual report of all traffic counts performed by RPCs and DOT during the year. NHDOT also conducts traffic counts and other data collection during the summer months for specific study and project development purposes, and will respond to local community requests for counts.*

NH 28 provides a parallel route to Interstate 93 in Salem and Windham and on to Manchester. This is a heavily travelled roadway with significant retail and other commercial development, particularly in Salem. Volumes range from 23,000-25,000 vehicles per day in Salem, to around 18,000 vehicles at the Windham town line, and to 12,000 vehicles per day at the Derry town line.

NH 33 provides a connection between Stratham where it intersects with NH 108 at the Stratham circle and I-95 in Portsmouth where it serves as a western route around the Great Bay. Improvements to the I-95 interchange and the opening of the southern entrance to the Pease International Tradeport in Portsmouth have boosted the traffic volumes on the roadway to 25,000 vehicles per day. Additional traffic is expected along this corridor as a large shopping center is under construction in Greenland.

NH 108 is a two lane roadway with ADTs ranges from 5,000 vehicles per day at the Massachusetts border in Plaistow, to 23,000 per day in Exeter and Stratham, where it serves commuters, commercial traffic, and provides a connection to NH 101. NH 108 continues on to Newfields where it exits the region carrying around 18,000 vehicles per day.

NH 111 provides a second east-west route through the RPC region that connects the coast in North Hampton to Windham, and continues west to Nashua. This facility interconnects Route 1, NH 125, NH 28, and I-93. The roadway has two distinct regions of heavy activity located around I-93 in the west, and Exeter and NH 101 in the east. Volumes range from a low of 5,000 vehicles per day in North Hampton, to 19,000 vehicles per day through Exeter, to 23,000 near I-93 in Windham (2005).

Table 1.7: Traffic Volume Comparison

January to April Volumes*

	2006-2007	2007-2008
US 1 in Hampton South of NH 101	-3.7%	+4.7%
NH 28 in Windham at Derry TL	-5.2%	+0.4%
NH 101 in Exeter East of NH 88	+.5%	-2.7%
I-95 in Seabrook at State Line	-.5%	-2.2%
NH 16 at Little Bay Bridges	-1.3%	-2.6%
I-93 in Salem at State Line	-2.1%	-1.5%

* at time of writing, only monthly volumes for Jan-April were available for 2008

Route 121 is a two lane roadway running between Atkinson (from the Massachusetts border) to Sandown where it exits the region. ADTs are 8,600 vehicles per day at the Atkinson/Hampstead town line. As residential growth continues in Atkinson and Hampstead, NH 121 is becoming increasingly important as a commuter route to the large employment centers in the Merrimack Valley and the Boston Metropolitan area. Traffic volumes on this roadway are growing at an average annual rate that is close to 5%, reflecting the residential growth seen in this part of the region.

Recent Progress

Some progress has been made since the previous Long Range Plan was adopted in the region. Some projects, such as the expansion of Interstate 93, the Newington-Dover bridge widening, and the NH 125 improvements in Plaistow and Kingston are much closer to construction, and other projects have been completed. Highway projects that have been completed include the following:

- Electronic Toll Collection System on all Toll Facilities
- Hunt Road-Newton Junction Road intersection on NH 125 in Kingston
- NH 111 Bypass in Salem & Windham
- NH 111 signal coordination in Windham
- Interim ramp and roadway improvements related to the Newington-Dover bridge and turnpike widening.
- Intersection of US 1 and NH 107 improvements
- NH 125 and Old County Road intersection in Plaistow is under construction
- Interstate 93 Park and Rides at Exit 2 and 4.
- Salem Bridges over Interstate 93.

In addition, planning has progressed on many projects. The Interstate 93 widening has aspects that have begun construction, and the Newington-Dover project is has completed the Environmental Impact Statement and is awaiting a Record of Decision. Planning is moving forward for the Memorial Bridge Rehabilitation as well as for the remaining improvements of the NH 125 project in Plaistow and Kingston. The US 1 Bypass improvements have completed preliminary design and portions of that project are advancing as funding becomes available. Finally, the US 1 Corridor Study is nearing completion as well.

Issues and Problem Areas

There are a number of issues and problem areas related to the regional system of roads and highways.

Traffic Growth and Congestion: Traffic volumes in the Region nearly doubled between 1986 and 1996, and since that time growth has continued although at a slower pace, reflecting slowing development in the region, as well as shifting employment and tourism patterns. For 30 years, the trend has been that traffic volumes grow over time, however recent significant increases in the cost of fuel and a general economic downturn are changing this. Nationwide, traffic volumes in 2008 are down from previous years, and this is generally reflected in local traffic counts. Examining the locations in the region where monthly volumes are available(Table 1.7), traffic is down in all locations except along US 1 in Hampton, and NH 28 in Windham for the year so far (January-April). It remains to be seen if this will be a long term pattern or one that changes back to growth as the economy recovers from the downturn and fuel prices stabilize.

The volume of commuters and tourists utilizing the roadways in the RPC region is great enough that there are a number of areas where roadway capacity is deficiencies. Some of the most problematic areas, such as the Little Bay Bridges area of the Spaulding Turnpike, and Interstate 93, are in the midst of planning and engineering work for construction that will alleviate the problem. However, there are others that are not being addressed in existing plans or construction. The NH DOT Statewide Transportation Model identifies general areas of congestion in the region and provides a short list of facilities impacted by heavy traffic. These roadways are shown in ***Table 1.8*** and consist of most of the primary routes in the region. If moderately congested roadways are considered as well, the list expands to include portions of almost all state highways in the region.

Table 1.8: Congested Roadways (LOS E and F) from NH DOT Statewide Model

US 1: Seabrook to Portsmouth	NH 111 in Windham and Salem
NH 28: Salem and Windham	NH 121A in Plaistow and Hampstead
NH 33: Stratham and Greenland	NH 125: Plaistow, Kingston, Brentwood, Epping
NH 101 in Hampton	NH 286: Seabrook
NH 108: Stratham and Newfields	I-93: Salem and Windham

The nature of the Statewide model returns information that is very generalized and includes entire roadways as congestion when in reality it is a much smaller area that is likely impacted. The analysis also does not make any determination as to the nature of the capacity deficiencies or what would be necessary to correct them. The Regional Travel Demand Model provides a more specific analysis that can identify intersections and smaller stretches of roadway that face congestion issues. As the regional model provides information in more detail, more precise information about congestion points can be obtained. The model estimates the volume of traffic demand and this information is compared to the capacity of the network to estimate congestion levels. Looking at the model base year (2005), the following additional areas are identified as congested:

- Portions of the NH 101 & I-95 Interchange
- The I-95 & Spaulding Turnpike interchange
- Woodbury Avenue in Portsmouth north of Gosling Road
- Grafton Drive, New Hampshire Avenue, and Pease Boulevard in the Pease Tradeport
- NH 107 between Interstate 95 and US 1
- NH 107 Near the intersection with NH 150

Congestion at the regions toll facilities is another issue facing both the **NH 16/Spaulding Turnpike** and **Interstate 95** corridors. Currently these facilities face significant congestion at times due to commuter and tourist traffic. The placement of **Electronic Tolls** at these facilities has mitigated much of the impacts of this congestion however summer traffic often causes delays at these locations on weekends.

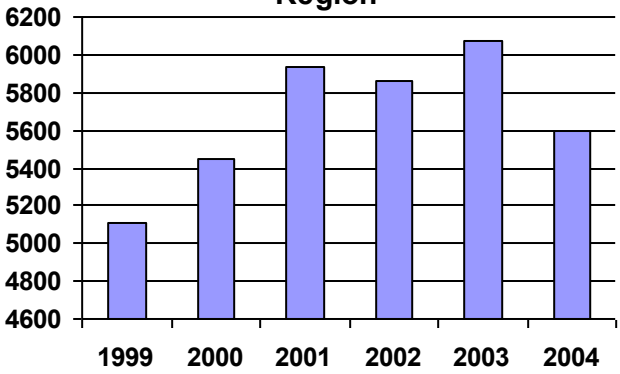
Bridges: The collapse of a bridge in Minnesota in 2007 has kindled new interest in the structural integrity of the bridges in New Hampshire and has accelerated work on many bridges in the area including the Memorial Bridge over the Piscataqua River between Portsmouth and Kittery. As of June, 2007, there were 15 "Redlisted" bridges (***Table 1.9***) in the region that are structurally or functionally deficient.

Table 1.9: Red List Bridges

Town	Location	Bridge Data
Danville	Sandown Rd over Exeter River	n/a
Exeter	Garrison Ln over Little River	Structurally deficient
Fremont	Scribner Rd over Exeter River	Structurally deficient
Fremont	Martin Rd over Piscassic River	n/a
Kingston	New Boston Rd over Powwow River	Structurally deficient
Newfields	New Road over B&M RR	Structurally Deficient
Plaistow	Garden Rd over Little River	n/a
Portsmouth	Cate St over Hodgson Brook	Structurally deficient
Portsmouth	US 1 over Scott Ave	Structurally deficient
Salem	Haverhill Rd over Spicket River	n/a
Salem	Lawrence Rd over Spicket River	Functionally obsolete
Salem	Emerson Way over Widow Harris Brook	n/a
Salem	Providence Hill Rd over Providence Hill Brook	n/a
Sandown	Fremont Rd over Exeter River	n/a
South Hampton	Hilldale Ave over Powwow River	Structurally deficient

Transportation Security: Events both nationally and around the world since 2001 have focused attention on the security of the transportation network of this country and how the transportation network can be used as a weapon against us as well as hinder evacuation in the event of an emergency. Much of the work involved in preparing for and responding to these events is necessarily immediate in nature however, there is a role for agencies involved in long term planning for how the transportation system will be prepared.

Figure 1.3: Accidents in the RPC Region



Traffic safety: During the period between 1999 and 2004, there were approximately 34,000 traffic accidents in the Rockingham Planning Commission region involving 62808 cars, trucks, bicycles, and pedestrians. The limits of the database and the size of the area being considered make detailed analysis difficult, but there is generally a trend that shows the number of accidents increasing between 1999 and 2003 with a sharp decrease between 2003 and 2004. In terms of the different types of accidents that occurring in the region, over 72% include a collision with another moving vehicle. Another 16.5% involve colliding with a fixed object such as a telephone pole, tree, or building. The remaining 11% of accidents include everything from striking an animal (2.7%), pedestrian (0.9%), or bicyclist (0.5%), to falling objects (0.5%)

Region wide, the general locations of the accidents are distributed mainly between intersection related (29%) and along the roadway (41%). An additional 8% are related to driveways, and almost 13% occur in parking lots. Friday is the most common day for accidents with almost 18% occurring on that day. The next highest day is Saturday with almost 15%. Most accidents occur under clear skies (62.5%), followed by cloudy (18.1%), Rain (8.6%) and Snow (7.6%).

The New Hampshire Department of Transportation recently completed a Strategic Highway Safety Plan for the state. This document proposes eight emphasis areas to focus on the goal of reducing the number of fatal accidents in the state and the fatality rate from the current 1.13 deaths per 100 Million Vehicle Miles of Travel (MVMT) to 1.0 per 100 MVMT. The eight emphasis areas each have a number of strategies and goals within them and are:

- ***Improving Crash Data:*** Improving the timeliness, accuracy, completeness, uniformity, integration, and accessibility of the highway safety and traffic records systems. This will aid in the analysis of crash information and provide reliable data to support efforts to address problem areas.
- ***Increasing Seatbelt Use***: NH currently ranks 50th of all states in seat belt usage (63%) and is well below the national average of 81%. Increasing seat belt use will have dramatic effects on the number of fatalities (65.7% were unbelted between 2003 and 2005 – 208 fatalities), as well as the number of serious injuries. The goal is to get NH to 83% seat belt use by 2010 through legislation, education, and enforcement.
- ***Adolescent and Elderly Drivers:*** Adolescent drivers account for 6.5% of the population in New Hampshire and 17% of the accidents and elderly drivers face physical, cognitive, and visual ability declines that lead to higher levels of accident involvement as well. The goal is to reduce adolescent motor vehicle fatalities and accidents through a combination of enforcement of seat belt laws, strengthening of graduated licensing law, and advanced skill training to improve driving abilities. For elderly drivers, the strategy is to update the procedures for assessing the medical fitness to drive, use DHHS resources to promote safe mobility choices, and invest in low cost modifications to roadways such as improving road sign visibility and pavement markings.
- ***Lane Departure:*** This area focuses on reducing the number of accidents related to motor vehicles leaving the travel lane either into oncoming traffic or off of the road entirely. The goal is to reduce the number of these types of crashes by 5% and the number of injuries reported from these accidents by 5% as well. This will be accomplished via developing a program to document, maintain, and extend the number of rumble strips in the state, through maintaining roadway clearance zones, and through the development of rural Intelligent Transportation Systems (ITS) technology to address lane departure crashes.
- ***Reckless Driving Behavior***: The goal of this emphasis area is to reduce the amount of reckless driving and resulting accidents by 24%. This will be accomplished via increase public awareness of the problem; more enforcement of existing laws, and law coordination of aggressive driver details by law enforcement.
- ***Impaired Drivers***: Since the mid-1990's, 30-40% of all fatal crashes in New Hampshire have involved drug or alcohol impairment with little change in that rate over time. The goal is to eliminate crashes where impaired drivers are at fault through education, and increased DWI patrols.

- ***Special Users:*** The focus in this area is to reduce the number of accidents involving bicycles, pedestrians, school buses, and commercial vehicles via targeted educational information.
- ***Emergency Medical Services:*** There are areas in NH where EMS coverage is less than ideal due to inadequate cellular coverage, fewer EMS personnel than necessary. The focus of this area is to reduce traffic fatalities and serious injuries by improving access to EMS services for roadway users, and improve EMS response through better determination of the accident location.

3.2 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 however most freight moves through the State by Truck (***Table 1.10***). Trucks carry 93% of goods moving within the state, 75% of the goods leaving, and 73% of those coming into New Hampshire. The share of truck freight is expected to increase to 76% for both imports and exports over time. Rail freight currently makes up about 4% of imports and 9% of goods and materials exported however this is expected to decline over time. Water and multi-modal freight movement all make up less than 1% each of freight movement and are expected to continue at those levels.

Figure 1.3 *Port of New Hampshire,*

Of the 31.1 million tons of goods being shipped within the state, the leading commodity by weight is gravel at 8.9 million tons, followed by nonmetal mineral products at 5 million tons. By value there was $8.4 billion shipped within the state. The leaders were mixed freight ($842.9 million), machinery ($734.1 million), electronics ($715.3 million), fuel oils ($715.1 million), and wood products ($509 million).

Table 1.10: New Hampshire Freight Flows (Freight Analysis Framework Estimates)

	2002						2035					
	Within State		From State		To State		Within State		From State		To State	
	#	%	#	%	#	%	#	%	#	%	#	%
Total	31.1	100	20.6	100	23.4	100	51.9	100	53.7	100	55.0	100
Truck	28.8	93	15.4	75	17.0	73	48.5	93	40.7	76	42.0	76
Rail	<0.1	<1	0.9	4	2.1	9	<0.1	<1	0.2	<1	4.2	8
Water	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1
Air, air & Truck	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	0.2	<1
Truck and Rail	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1
Other Intermodal[1]	<0.1	<1	0.1	<1	0.2	<1	<0.1	<1	1.7	3	0.5	<1
Pipeline & Unknown[2]	2.2	7	4.2	20	3.9	17	3.3	6	11.1	21	8.0	15

[1] Other intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations except air and truck.
[2] Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.
Note: Numbers may not add to totals due to rounding.

New Hampshire ships 20.6 million tons of goods out of the state. Coal and petroleum products comprise 4.2 million tons, nonmetal mineral products 2.1 million tons, wood products 1.8 million tons, natural sands 1.5, and fuel oils at 1.4 million tons. By dollar value, NH ships approximately $31 billion

worth of goods. The largest components of this are electronics ($6.9 billion), machinery ($3.1 billion), mixed freight ($2.2 billion), miscellaneous manufacturing products ($2.1 billion), and textiles and leather goods ($1.8 billion).

NH received 23.4 million tons of goods. The largest commodities were coal and petroleum products (3.9), gasoline (2.1), coal (1.7), wood products (1.5), and mixed freight (1.3). There were $33.3 billion worth of goods shipped to the state. The greatest value commodities were mixed freight ($4.5 billion), electronics ($3.2 billion), machinery ($2.9 billion), miscellaneous manufactured products ($2.7 billion), and pharmaceuticals ($2.4 billion).

Both in terms of tons of goods (32%) and dollar value (24%), Massachusetts is New Hampshire's largest trading partner, Maine its second largest (17% and 9%).

For current volumes, freight services are generally adequate within the region. Freight carriers in all the key modes of transportation serve the area very well. Companies have access to a rich array of freight transportation services that permit access to markets throughout North America and the world. Nevertheless, it is likely that the freight infrastructure is not sufficient to manage the full potential of continued growth in the volume of freight that originates, is destined for, or simply passes through the region.

Table 1.11
Public Grade Crossings
Main Line New Hampshire

Name	Location
Foundry St	Rollinsford
Central Ave	Dover
Chestnut St	Dover
Elm St	Newmarket
NH 108	Newmarket
Squamscott St	Newfields
Salem St	Exeter
Main St	Exeter
Front St	Exeter
Powder Hill Rd	Exeter
Sanborn Rd	E Kingston
NH 107	E Kingston
New Boston Rd	Kingston
Russ Xing	Newton
Main St	Newton
Cranes Xing	Newton
Main St	Plaistow

Source: Guilford Rail System

A considerable quantity of freight movement in the region is "overhead" freight. Overhead freight is freight that moves through the RPC, but neither originates nor terminates in any of its communities. Overhead rail freight moves on the main rail line of Pan Am Railways. Freight on this line includes daily trains operated by the New Hampshire Northcoast Corporation between Ossipee and Boston. Overhead motor freight moves heavily on Interstates 93 and 95, the Spaulding Turnpike as well as NH 101 and 125. The implications of overhead freight for the region include inconvenience, congestion, and cost without economic benefit from the vehicles and goods passing through.

Current Modes of Freight Movement

While goods move into and out of the state primarily by Truck, the RPC region has a broad array of freight modes available within the region.

Ocean: The region is host to the Port of New Hampshire in Portsmouth, an active port handling almost 5 million tons of cargo each year. 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, 50,00 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, the Seacoast 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.

Rail: The area is served by the main line of Pan Am Railways (formerly Guilford Transportation Industries), a major US regional railroad. Branch line freight services are currently available between the Guilford main line and Salem, as well as to Portsmouth and over the Sarah Long Bridge into Maine, as well as down the Eastern Rail line to Hampton. The original Eastern Line extended from Portsmouth to Seabrook and crossed a bridge across the Merrimack River into Newburyport, MA. The line from Portsmouth to Hampton is currently open for occasional low speed freight shipments, but the section between Hampton and Seabrook is not functional and has been removed in some locations. In addition, the bridge over the Merrimack River is in serious disrepair. Intermodal (rail-truck) facilities operated both by Guilford 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. Seacoast shippers and receivers are well served by motor carriers. High quality services are provided by Seacoast-based companies such as Northern New England Transportation, Atlas Motor Express, and by the following types of carriers:

- National LTL (less-than-truckload) carriers such as Roadway, Yellow, Consolidated Freightways, and Con-Way
- Regional LTL carriers such as New Penn, Red Star (which is part of a collection of regional carriers called US Freightways), and Estes.
- Major TL (truckload) carriers such as J.B. Hunt and Schneider National.
- Bulk liquid carriers such a Superior and Matlack.
- Private carriers serving special markets such as the fleet of trucks operated by Wal-Mart.
- 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. There is also 45,000 square feet of warehouse facilities available in close proximity to rail, deep water port and I-95. Boston's Logan Airport, located less than 50 miles away, adds access to a wide variety of air cargo services serving markets throughout North America and the world. In addition, the region has access to air cargo services available from airports in Manchester, and Portland, ME. Major carriers offering service include Emery Air Freight, BAX, Federal Express and UPS.

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." 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 resources into the New England region from the Southeast States.

With the exception of air based freight services at Pease Tradeport, and Atlas 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 available in Salem, Portsmouth, and Hampton, all rail shipments are loaded in or on rail cars at rail facilities located outside the area as well. The Port of New Hampshire is also 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.

Recent Progress

While there are no projects that were specifically designed to improve freight capacity there has been some work that has benefits to the freight system.

- In the Spring of 2008, the RPC in conjuction with the Strafford Regional Planning Commission completed a Regional Intelligent Transportation Systems (ITS) Architecture and ITS Strategic Plan for the regions. Many of the proposals in these documents will have benefits to freight movement in the region.
- NH 85 Bridge over the B&M Mainline in Newfields. The replacement of this bridge with a new structure has improved the clearance for trains and will allow double stack cars.
- The Newington-Dover project will be constructing the piers necessary to run a rail line over the Spaulding Turnpike in Newington and allowing for Pease to be connected by rail to the Port of New Hampshire as well as to the B&M Mainline.
- Implementation of Electronic Toll Collection on the Turnpike System in New Hampshire has had benefits for truck freight movement as well

Freight Issues

Problems relating specifically to freight transportation in the RPC region appear to be generally local in nature. Areas of concern include congestion, the location of marked truck routes, operation of double trailers, and safety. Congestion is an issue is locations such as I-93 in Salem, NH 16 in Newington, the Hampton Toll facility on Interstate 95, and route 125 through Plaistow. Truck routes are an on-going issue that arises in local areas as business conditions change. It appears that truck routing issues are

effectively dealt with as they arise. Operation of doubles does not appear to be a major issue in any area.

Freight Capacity: While freight transportation resources in the region are generally adequate for today's traffic, there are still many needs that remain unmet. Future growth may very well result in shipper demand for enhanced freight services in all modes of freight. It is entirely conceivable that the regions excellent location with respect to Halifax harbor and the Boston, Manchester and Portland markets may result in expanded use of the region around Pease as a center of distribution. The area offers a prime location for a major producer of goods who needs access to ships, railroads, trucks and air services for distribution of manufactured goods and/or receipt of raw materials. Similarly, given the access to several major highways, the area also provides an opportunity for a broad based provider of transportation and distribution services for domestic and international markets. Given this, there are a number of deficiencies in the freight transportation system of the seacoast, such as:

- ***Limited airfreight services at Pease Airport***. Expansion of these services is needed to allow later cutoff times so that Seacoast companies can be more competitive in meeting the needs of their customers worldwide.
- ***Single track rail lines*** on the NH Mainline which limit freight (and passenger) volumes.
- ***Low bridges over rail lines*** that prohibit the use of double stack rail cars. As shown in **Table 1.12** there are many bridges on the mainline (23) that have inadequate vertical clearance over the rail lines, and this limits the ability of freight carriers to use double stack cars on their trains.
- ***Toll booths*** on highway mainlines that produce delays and congestion. The toll facilities on Interstate 95 and the Spaulding Turnpike provide a valuable service in collecting revenues that help to maintain the highways. However, they also create congestion and delay that affect freight movement within the region. Delay is created be slowing the truck traffic down to pay a cash toll or to perform a weight check. This slowing also creates congestion in two ways. First, the slowing traffic creates

Table 1.12: Vertical Clearance of Bridges on the B&M Main Line in New Hampshire

Milepost	Bridge Name	Location	Height ft/ in		Owner
240.69	Dover Road	Rollinsford	18	10	NH
241.81	Rollins Farm	Rollinsford	19	3	B&M
242.98	Oak Street	Dover	17	6	NH
244.53	Washington Arch	Dover	18	9	NH
244.99	Spaulding Tpk	Dover	19	8	NH
45.30	Littleworth Rd	Dover	17	4	NH
247.16	Bellamy River	Madbury	18	3	NH
247.77	Daleys	Madbury	17	4	NH
248.14	Town Hall Rd	Madbury	17	4	NH
248.31	Rte. 4	Durham	22	+	NH
249.33	Durham Road	Durham	17	4	NH
250.06	Mill Dam Road	Durham	18	3	NH
251.43	Bennett Road	Durham	17	4	NH
253.75	Main Street	Newmarket	17	6	NH
254.72	Mathes Farm	Newmarket	17	6	B&M
255.53	Rte. 108	Newmarket	18	3	NH
256.41	Main Street	Newfields	17	6	NH
259.09	Rte. 101	Exeter	22	+	NH
260.38	Park Street	Exeter	17	3	NH
263.50	Giles Road	East Kingston	17	6	TOWN
266.45	Powwow River Rd	East Kingston	18	5	NH
268.88	Partridge Hill Rd	Newton	17	3	NH
272.17	Old Stage Rd	Plaistow	18	1	NH
273.69	Hampstead Rd	Plaistow	18	3	NH
274.53	Haverhill Street	Plaistow	17	9	NH

Source: Guilford Rail System (Now Pan Am Railways)
Key: B&M = Guilford/Pan Am Railways,
NH = State of New Hampshire

queues for the tolls and weight checks, as vehicles are not processed at a uniform speed. Second, the tolls create a certain amount of diversion of truck traffic off of the highway system and onto the secondary road system as drivers try to avoid the congestion at the tolls, or the vehicle checks or even the cost of the toll itself.

- ***Limited intermodal freight connections***. While airfreight service at Pease does allow for transfer between air and truck, and recent indications that container service at the Port of New Hampshire will resume and create a ship-truck transfer point, the services offered by these two facilities is limited, and there is no intermodal connection with rail service through the region.

Service Facilities: One freight related resource that has seldom been discussed until recently, is the availability and adequacy of parking and service facilities for commercial vehicles and the impact that this can have on the highway network. A Federal Highway Administration Report released in 2002, entitled *Study of Adequacy of Commercial Truck Parking Facilities – Technical Report* (FHWA-RD-01-158), determined that while nationally there appears to be an adequate supply of public and private parking available at rest areas and travel centers, due to the distribution of these spaces and how they are utilized (frequency and duration) there is a perceived shortage in many areas. The study inventoried public and private facilities, surveyed drivers, and estimated demand for each type of facility. Some of the conclusions from the study are the following:

1. Inadequate parking supply for rest facilities can cause tired truck drivers continuing to drive because they don't believe that they will be able to find a place to park to rest, and drivers finding places to park that are unsafe such as the shoulder of the road, or entrance/exit ramps.
2. The problem of truck parking is a localized issue due to the uneven distribution of service facilities.
3. Factors that influence truck parking must include some flexibility to address the uneven distribution of facilities. For example, fatigue regulations limit the time drivers spend behind the wheel and so they need some flexibility in where they park. Is it safer for a driver to spend more time behind the wheel to reach a service facility, or to pull over to a shoulder at a potentially unsafe location to rest?
4. Government should play a role in addressing the issue of adequate commercial vehicle parking. This can be done through the implementation of ITS strategies that provide information on parking location and availability and through improving or expanding public parking areas.
5. The utilization of public and private parking along interstates and other National Highway System routes carrying more than 1000 trucks per day in New Hampshire is approximately 40% of capacity. Public facilities were used at approximately 84% of the capacity, while private facilities were 35% of capacity. There is no information in the report that breaks this data down to a more localized area.

Whether parking for commercial vehicles is adequate in the region is unknown at this time and would need to be the subject of a separate study. However, past studies of the Travel Center at the intersection of NH 33 and Ocean Road in Greenland would suggest that during certain times of the day at least, there is more demand for truck parking than there is supply available.

Preservation of Rights-of-Way: Federal legislation is also specific in requiring that MPOs, while developing transportation plans and programs, consider factors such as "preservation of rights-of-way for construction of future transportation projects, including identification of unused rights-of-way which

may be needed for future transportation corridors for which action is most needed to prevent destruction or loss". The likelihood of an increase in demand for freight transportation services in the Seacoast means that plans need to be made to protect land, rights of way, facilities and resources. Examples include the following:

- Preservation of rail rights of way through Pease.
- Preservation of land and rights of way for increased truck and rail volume between the Port of New Hampshire and Pease Tradeport.
- Preservation of land in the area of the Port of New Hampshire to accommodate major increases in business and to preserve access to the port.
- Preservation of the rail bridge between Portsmouth and the Portsmouth Naval Shipyard.
- Preservation of the rail right of way between Portsmouth and Newburyport, MA.
- Maintenance of channel depth at the Port of New Hampshire through regular dredging.
- Preservation of the right-of-way on the abandon branch line between the primary Pan Am railway line in Massachusetts and Salem.

Efficient Use of Resources: States and MPOs develop transportation plans which consider ways to meet transportation needs by using existing transportation facilities more efficiently. As the region grows, traffic on all roads will increase, including on the major limited access highways in the region used intensively by trucks. An effort needs to be made for identifying means of preserving capacity for both trucks and automobiles as much as possible before widening these facilities. One approach to dealing with this issue is to increase the capacity of the highway network through the use of Intelligent Transportation Systems (ITS) and both the State of New Hampshire and the Planning Commission have ITS Plans in place to address this issue. The State of New Hampshire implemented Electronic Toll Collection (ETC) on the turnpike system, with significant benefits to processing speed, emissions reductions, and revenues at all locations. There is room for improvement in this arena with the potential for eventual high speed, barrier-less tolling in at least some locations.

Information and Communications Technology: There are a number of technological advances being implemented worldwide, that are having an impact on the distribution of freight as well as the information available to regulatory and statistical agencies. In the United States, the Intelligent Transportation Systems (ITS) initiatives of the US DOT have a component completely dedicated to Commercial Vehicle Operations (CVO). These have generally taken the form of technologies that help to improve the efficiency and safety of goods movement. Some examples of this type of improvement are:

- **CVISN:** Commercial Vehicle Information Systems and Networking (CVISN) is a collection of information systems and network communications that provides a framework for the motor carrier industry and government agencies to exchange information and perform business transactions electronically. Key components of this program include the electronic exchange of safety and inspection information, electronic credentialing (registering to operate a commercial vehicle), and screening (**Weigh In Motion**) which minimizes delay for safe and legal vehicles. Working in conjunction with Electronic Toll Collection, this system allows those vehicles that are safe and legal to proceed with minimal delay permitting enforcement agencies to focus on high risk individuals.

- **Cargo & Equipment Tracking Technologies:** The use of advanced communications technologies is rapidly improving the ability of shippers to identify and track cargo and transports anywhere in the world in real time. Radio Frequency (RF) technology is being used extensively to track equipment in freight yards and to track movements through gates. Cellular phones are used to maintain direct communications between dispatch and distribution. Bar codes are used to identify cargo and smart cards identify drivers and vehicles and allow for toll and gas payments. Finally, GPS and related technology allows for locating of cargo anywhere in the world within a few meters.

Local Truck Routes and Double Trailers: Truck routes and the operation of double trailers are issues that occasionally arise at the local level. Conversations with a sampling of town officials suggest that these issues are being effectively handled at the local level. However, truck movements through residential neighborhoods are a problem in many communities. One State Statute of significance to this issue is New Hampshire RSA 266:11-II(c) which authorizes the Commissioner of the NH Department of Safety

> "…to designate other roads or highways [*in addition to the Interstate and Defense Highways, and travel within one mile of those facilities to reach various destinations*] the State of New Hampshire for legal use for semi-trailers 53 feet in length or less."

What this entails is that trucks with larger semi-trailers (greater than 48' in length) have limited authority to travel on state roads that are not part of the national system of interstate and defense highways or are not on the roads associated with RSA 266:11-II(c). The exception to this is that the statute allows

> "…travel within one mile adjacent to these roads in order to reach terminals, other points of pickup and delivery, for fuel, repairs, food or rest."

In the RPC Region, Interstates 93, 95, The Spaulding Turnpike (NH 16) and NH 125 are on the National Highway System. In addition to the specific roadways listed as part of the National Highway System, RSA 266:11-II-(c) lists the entire lengths of NH 28, NH 33, NH 101, and NH 111 as allowing these larger semi-trailers. This statute applies to state roadways, and a community would need to adopt a similar law to enforce this type of standard on its local roadways.

Information Sharing: The making of good policy is dependent on the availability of good information. Information needs include more detailed shipper and receiver data, origins and destinations, information on carriers, more localized freight information, and truck flow data. In addition, understanding the issues that are important to shippers and receivers in the region would provide input to the MPO on what needs to be addressed.

Freight Security: The movement of freight into, out of, and around the United States has come under increased scrutiny in recent years. While the nature of the threats to the freight network necessitate constant monitoring by directly involved authorities, and immediate response from security and public safety organizations, there is also a role for regional transportation planning agencies. This is not an area however that MPOs or Planning Commissions have traditionally been involved in, and each one will have different resources that can be applied to the issue. Given the newness of this issue as a focus in transportation planning, a number of things need to be considered and answered:

- What is the role for the Planning Commission in systems operations and freight transportation security/disaster planning for the region?

- How can the region incorporate security and disaster planning aspects into the project prioritization process so that projects get into the TIP and the Long Range Plan.
- Can the RPC act as a forum for discussion of Freight network security issues to coordinate planning.
- How can the RPC incorporate freight network planning into the current work with FEMA and the local communities to develop more complete hazard mitigation plans.
- Determine how to best analyze the transportation system for freight related capacity and safety deficiencies.

3.3 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 doubled in the past six years, from five to eleven; 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 half of the 27 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***.

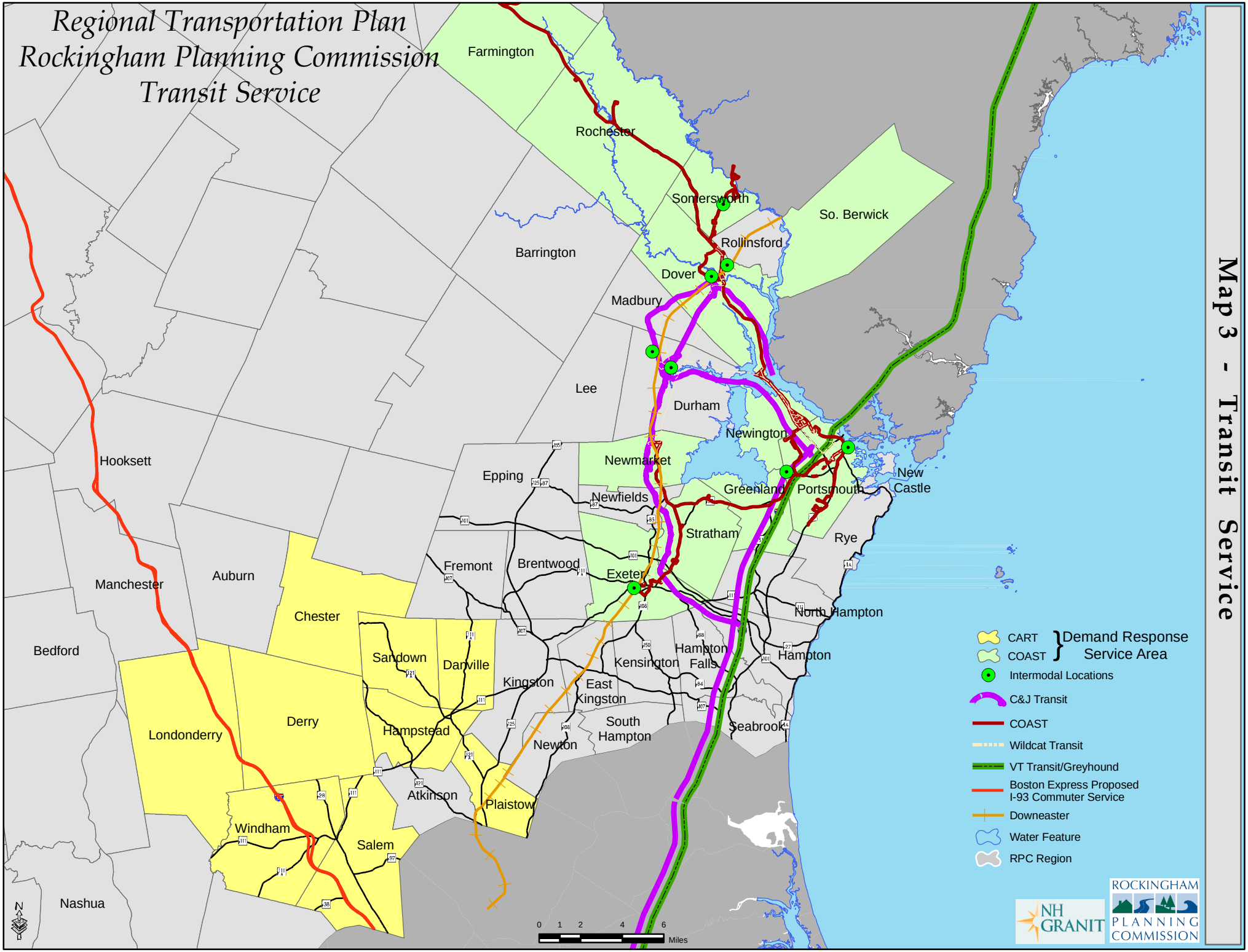
Local & Regional Public Transportation Service

Two public transit agencies serve the communities in the RPC region. The Cooperative Alliance for Seacoast Transportation (COAST) provides service in Exeter, Stratham, Greenland, Portsmouth and Newington, with connections northward to Dover, Somersworth, Rochester, Farmington, and South Berwick, Maine. COAST has set ridership records in four of the past five years, carrying over 460,000 rides in FY2011, and is on-track to carry over 500,000 rides in FY2012. The new Greater Derry-Salem Cooperative Alliance for Regional Transportation (CART) provides demand-response public transportation to six RPC communities, including Salem, Windham and Hampstead; as well as Derry, Londonderry, Chester, and out-of region medical facilities in Manchester and northern Massachusetts. The CART service has grown from carrying fewer than 500 passengers/month at start-up in 2006, to nearly 1,500 passengers/month in mid-2008. A third fixed route system is UNH Wildcat Transit. Wildcat Transit connects the UNH campus in Durham to Newington and Portsmouth in the RPC region, as well as to Dover, Madbury, and Newmarket.

Table 1.13 – COAST Ridership

Fiscal Year	Ridership
1998	170,218
1999	179,831
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

Source: COAST


Regional Transportation Plan
Rockingham Planning Commission
Transit Service
Map 3 - Transit Service
Farmington
Rochester
Somersworth
So. Berwick
Rollinsford
Barrington
Dover
Madbury
Lee
Durham
Newington
Hooksett
Newmarket
Epping
New Castle
Greenland
Portsmouth
Newfields
Stratham
Rye
Fremont
Brentwood
Exeter
Manchester
Auburn
Chester
North Hampton
Bedford
Sandown
Danville
Hampton Falls
Kensington
Hampton
Kingston
East Kingston
Londonderry
Derry
Hampstead
South Hampton
Seabrook
Newton
Atkinson
Plaistow
Windham
Salem
Nashua
CART
COAST
Demand Response Service Area
Intermodal Locations
C&J Transit
COAST
Wildcat Transit
VT Transit/Greyhound
Boston Express Proposed I-93 Commuter Service
Downeaster
Water Feature
RPC Region
0 1 2 4 6
Miles
N
NH GRANIT
ROCKINGHAM PLANNING COMMISSION

Intercity Bus Service

Intercity bus service is available in the I95, I93, and NH Route 125 corridors, with an emphasis on Boston-bound commuter travel as well as access to Logan Airport. C&J, formerly C&J Trailways, provides over 20 round trips daily between Boston and the Portsmouth Transportation Center, with northbound connections to Dover. Greyhound provides two daily round trips between Portland and Boston with service to downtown Portsmouth; while the Coach Company provides two daily commute hour trips from Plaistow to Boston via Newburyport. 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.

Passenger Rail Service

Amtrak's Downeaster service between Portland and Boston includes several station stops in Southern Maine, Northern Massachusetts, and three New Hampshire communities – Exeter, Durham, and Dover. The service expanded in 2007 to feature five daily round trips, plus a supplemental sixth commuter trip via bus. During FY2008 the Downeaster carried over 440,000 riders, with over 30% of passengers boarding or alighting at New Hampshire stations. MBTA commuter rail service is available from Newburyport and Haverhill in Northern Massachusetts.

Park & Ride Facilities

There are currently eight Park & Ride facilities in the region operated by the NH 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 Windham at Exit 3 on I93; 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.

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 & Taxi Services: At least twenty companies offer shuttle services between the Seacoast and Logan and Manchester Airports. Both door-to-door service and scheduled pickups at central locations are available. Ten companies also offer local taxi service.

Special Population Services: There are more than two dozen health and human service agencies in Rockingham County providing demand response transportation for agency clients or specific eligible populations such as senior citizens or individuals with disabilities. Most 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 activating vehicle time that is currently idle for lack of operating funds.

Recent Progress

- Initiation of the Greater Derry-Salem CART regional transit service in October 2006, providing public demand-response transit service to nine communities, six of which are in the RPC region.

- Construction of track improvements enabling a fifth daily round trip train on the Amtrak Downeaster. A sixth daily commuter oriented trip via bus was also initiated by C&J in 2008 with CMAQ funding.
- Adoption in 2006 of a statewide plan for transit coordination through a regional system of transit brokerages, developed as part of the Federal Transit Administration (FTA) United We Ride initiative. This coordination will eventually involve a restructuring of how the NH Department of Health and Human Services (DHHS) funds transportation services, rechanneling funds through these regional brokerages. It is anticipated that CART and COAST will take on these regional coordination roles.
- Revitalization of regional transit coordination efforts in the Seacoast through the Alliance for Community Transportation (ACT). ACT includes more than a dozen transit providers serving Eastern Rockingham and Strafford Counties.
- Flexing of federal Surface Transportation Program (STP) funds to the FTA 5310 program for use in purchase of service contracts by regional transit coordinators/ brokers. This is a critical step in the implementation of the United We Ride transit coordination initiative.
- Initiation of Transportation Assistance for Seacoast Citizens (TASC), a regional volunteer driver program serving seniors and individuals with disabilities in the eight communities of Exeter, Greenland, Hampton, Hampton Falls, North Hampton, Rye, Seabrook, and Stratham.
- Initiation by COAST of Summer weekend transit service between Epping, Exeter, and Hampton Beach. The pilot is intended as a first step toward regular service between the towns.
- Construction of new Park & Ride facilities at Exit 9 on the Spaulding Turnpike in Dover to support intercity bus service and COAST Spaulding Turnpike Express service; and in Salem at Exit 2 on I93 to support the Expanded Commuter Bus service that is a mitigation measure for the widening of I93.
- Initiation of a Bi-State Transit Investment Study, as required by US EPA as part of the I-93 EIS process. The study is looking at future transit needs for the I-93 corridor, especially once I-93 again reaches capacity following the current proposed widening.
- Systemwide ridership increases on COAST, CART, C&J, Wildcat Transit and the Downeaster. All of the transit services experienced record ridership in FY2007, with monthly records continuing in FY2008 as fuel prices have led more commuters to consider alternative ways to get to work.

Issues and Problem Areas

There are a number of issues and problem areas related to transit access in the region.

Non-Federal Funding for Transit: In the past ten years New Hampshire has ranked in the bottom 4-8 states nationally in the amount of State funding contributed to public transportation. In 2007 average state spending on public transportation was $36.96. Removing the influence of states with major urban rail systems, the median state investment was $4.59. In comparison, New Hampshire contributed $0.45 per capita to public transportation. Most matching funding for COAST and CART is provided by municipalities. This reliance on municipal funding can create instability, especially in difficult municipal budget years. Beyond funding for bus transit, New Hampshire has even more problems in funding rail service, as the NH 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.

2010 Census and Potential Loss of FTA Operations Funding: Transit agencies in urbanized areas with populations between 50,000 and 200,000 are able to use FTA Section 5307 urban formula funding to support transit operations, as well as capital and maintenance expenses. Transit agencies in urbanized areas with populations over 200,000 may only use Section 5307 funding for capital and maintenance expenses. Following the 2010 Census, much of southern New Hampshire is likely to be absorbed into the Boston Urbanized Area. For COAST this would create a funding gap of over $1 Million per year that would need to be filled from state or local sources in order to avoid service cuts. Given the existing challenges with non-federal funding identified above, this will be difficult. For CART it would mean a funding gap of over $300,000. Legislation has been proposed in Congress which would allow smaller public transit agencies, with fewer than 100 buses operating at peak hours, continued flexibility to use FTA funding for operations even in Large Urbanized Areas.

Regional Land Use Patterns: As discussed in Section 1.1, existing land use patterns represent one of the most significant challenges to expanding transit service in the region. Development that is spread out over a large area is much more difficult to serve with transit than a compact development pattern, where centrally located stops can serve many residents and businesses within a short walking distance. Portsmouth, with its relative density and proximity of residential, retail, and employment locations, has worked with COAST to develop a solid network of transit connections throughout the city. For much of the central part of the RPC region, development densities are low enough that regular fixed route bus service is not practical. CART has sought to address this through use of demand response service, and eventually deviated fixed route service. To the extent that the communities of the region implement more compact development patterns, transit connections throughout the region can be more readily implemented.

Lack of Coordination Among Transit Services: Beyond the public transportation and intercity bus and rail services described above, there are dozens of health and human service agencies in the region which provide demand response transportation service for various populations – in particular senior citizens, individuals with disabilities, and low income residents who are clients of specific human service agencies. These agencies have historically operated independently with little coordination. While their vehicle operations should not be viewed as duplicative, in that taken all together they collectively still do not meet the full trip need for transit dependent residents in the region, each service typically maintains its own trip scheduling and dispatching capacity. At the same time, agencies often only have operating funds for part-time drivers, such that vehicles are not fully utilized. SAFETEA-LU introduced new requirements to develop plans for coordination among these entities, with a goal of improving efficiency by centralizing functions such as scheduling, dispatching and billing, or developing joint agreements for maintenance and vehicle purchases. The RPC has been a partner in developing two Public Transit/Human Service Transportation Coordination Plans – one for the communities of the CART region in the western part of Rockingham County, and a second for the COAST region, broadly defined as including Eastern Rockingham County and Strafford County.

Safety and Security: Safety and Security on public transportation systems has been a developing priority since the terrorist attacks of 2001. Under SAFETEA-LU, a formal role for MPOs was established, ensuring that Safety and Security issues are addressed in all aspects of planning regional transportation systems. Because both COAST and CART utilize FTA Section 5307 funding, each agency is already required to develop Safety and Security plans. COAST adopted their plan in 2003, and as of summer 2008 is working on deployment of security camera systems on their buses. Because of its cooperative management agreement with the Merrimack Valley Regional Transit Authority (MVRTA), CART has operated under MVRTA's safety and security plan. However, CART will need to develop its own plan as part of the

process of securing status as a Designated Recipient of FTA Section 5307 funds, which should be finalized in late 2008 or 2009.

Intelligent Transportation System Opportunities: At present neither COAST nor CART employs intelligent transportation system technology such as automatic vehicle locators, mobile data terminals, or signal prioritization. However, CART currently uses paratransit scheduling software that is equipped to integrate these technologies. Both transit agencies participated in the development of Regional ITS architecture mandated by SAFETEA-LU.

3.4 Transportation Demand Management

Transportation Demand Management, or TDM, is an approach to improving the efficiency of the transportation system through encouraging alternatives to driving alone – particularly for commute trips. A number of TDM initiatives serve the RPC region, including statewide programs for New Hampshire and Massachusetts, as well as Seacoast Commuter Options, a regional Transportation Management Association (TMA) working with seacoast employers to reduce commute trips. Efforts targeting Boston area commuters have a relatively 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 within 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, as with transit ridership, increasing gas prices have led to increased interest and participation in ridesharing in the past year. Similarly, mitigation requirements for upcoming projects to widen I93 and the Spaulding Turnpike will expand TDM options in the next several years. The following pages outline existing TDM programs serving the RPC region.

Ridershare Programs Managed by NHDOT & Massachusetts Entities

Since 1996 the NHDOT has run a statewide Rideshare program designed to match individuals interested in carpooling or vanpooling using an on-line ridematching service. This program has had little success historically, in part due to limited staff time for employer outreach. However, during the first half of 2008 the program has seen inquiries increase more than six-fold, from an average of 30 per month to more than 200 in May 2008.

MassRides, funded by the State of Massachusetts, currently operates a relatively successful ride matching and vanpool program for Boston commuters, with daily vanpools departing from Portsmouth, Salem, and Windham.

Transportation Management Associations (TMA) - Seacoast & Salem

Seacoast Commuter Options is the Transportation Management Association (TMA) established to serve employers at the Pease Tradeport and the Greater Portsmouth Area. TMAs work with employers to promote alternative commute options to employees and establish incentives such as discounted transit passes, online ride matching programs, reduced parking fees for carpooling, emergency rides home for transit users, and programs allowing use of pre-tax dollars for transit or vanpool expenses. Funding has also been secured through the CMAQ program to establish a TMA serving employers in downtown Salem as part of the Town's Salem Employment Trip Reduction Integration Program (SE-TRIP). It is scheduled for launch in late 2008 or 2009.

Park & Ride Facilities

There are currently nine Park & Ride Facilities in the RPC region, located in Epping, Exeter, Hampstead, Hampton, Plaistow, two in Portsmouth, Salem (under construction), and Windham. The facilities have some combination of amenities such as phone, lights, bike racks, bus service, and bike lockers. Facilities served by transit, such as Portsmouth, Plaistow, Exeter, have historically seen heavy use. Those without transit service have seen limited usage historically, but are increasingly being used by car-poolers responding to recent gas price spikes.

Telecommuting Infrastructure

Access to high-speed telecommuting infrastructure continues to improve, but there are still gaps within the region. Approximately 24% of respondents to the regional survey indicated that they telecommuted or worked from home at least one day per week, with almost 10% indicating that they do so daily.

Recent Progress

- Shift of management of the Seacoast Commuter Options TMA to COAST, allowing relaunch of the service in early 2013
- Funding programmed for the Salem Employment Trip Reduction Integration Program (SE-TRIP) in Salem, featuring a TMA and employment-oriented fixed route transit service between Salem and Derry.
- Construction of new Park & Ride facilities at Exit 2 on I-93 in Salem, and Exit 9 on the Spaulding Turnpike in Dover.
- Funding programmed for a TDM marketing campaign to accompany launch of the I-93 Expanded Commuter bus service
- Initiation in 2003 of annual events for Bike/Walk to Work Day in the Seacoast, coordinated jointly by Seacoast Area Bicycle Routes, Seacoast Commuter Options, and the RPC.
- One setback has been the loss of commuter bus/vanpool service from the Windham Park & Ride to Lowell Junction/Ballardvale Industrial Park operated by the Junction TMO.

Issues and Problem Areas

Transportation demand management efforts have had difficulty gaining traction in the region, and more broadly in much of New Hampshire. There are a number of reasons for this. The first includes the standard challenges in promoting TDM - traffic congestion, parking and fuel prices, and travel time all need to be relatively high to convince drivers to shift modes. A second factor is the currently limited nature of alternative commute options, including the delay in implementing the proposed COAST Spaulding Turnpike Express Bus service while the Exit 9 Park & Ride is built. Finally, the current funding model for Seacoast Commuter Options, wherein NHDOT provided three years of operating costs with an expectation that employer dues would sustain it, as in Massachusetts, has not been workable. This model has worked in Massachusetts, but State regulations there require large employers to join such programs.

Seacoast Commuter Options staff have found interest in the program among employers when it is offered a no cost or nominal cost, but lack of willingness to contribute at a dues level high enough to sustain the program. This may change as rising fuel prices lead more workers to seek other commute options, and employers have increasing difficulty in securing staff. As noted above, inquiries regarding the NH Rideshare program have increased more than five-fold during 2008 in response to rising gas prices. At the same time, to the extent that a successful TDM program is necessary as mitigation for the

Spaulding Turnpike widening, as provided for in the Environmental Impact Statement for the project, it seems likely that State funding will be necessary to sustain it.

TDM efforts should be concentrated on companies and areas that have particular reasons for pursuing alternative commute programs, such as a parking shortage. Downtown Salem is a strong candidate for a Transportation Management Association (TMA), with its concentration of large employers. At mid-day on a weekday Salem's resident population of 28,111 balloons to over 80,000 including workers and shoppers, creating significant congestion on NH 28 and other local roadways. A TMA serving downtown businesses can promote ridesharing to mitigate some of this congestion, and be a partner in development of a regional transit system connecting workers in New Hampshire and Massachusetts with employment opportunities in Salem.

3.5 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 conditions for non-motorized transportation is a key policy of the MPO. According to the most recent National Household Travel Survey, more than 60% of all trips are fewer than five miles in length, and more than 22% are shorter than one mile – distances easily traveled by bicycle or on foot. However, more than 80% 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, 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.

Bicycle Transportation Facilities

For the purposes of this report 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); and off-road paved multi-use paths. Of course, many roads without such provisions are legally and appropriately used by bicyclists. In addition, the State Bureau of Trails maintains a number of trails in the State and region that are unpaved or paved with gravel.

Paved off-road paths in the region are uncommon, but include the Windham Rail Trail, a side-path in Odiorne State Park in Rye, and a short path connecting Fox Point Road in Newington to the Pease Tradeport. Planning is also underway for the NH segment of the East Coast Greenway, stretching from Florida to Maine.

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. The RPC has worked with Seacoast Area Bicycle Routes and member communities to secure funding to extend shoulders and complete regional routes including the Great Bay Bicycle Loop and the Exeter-Hampton-North Hampton Bicycle Loop. The success of these efforts has varied by municipality, depending on the willingness of Towns to appropriate matching funding needed to access Transportation Enhancement funding. Two Towns, Hampton and Newfields, have secured TE or CMAQ funding but later lost if after failing to appropriate matching funding. This points to the need for a more active role on the part of the State in

ensuring safe bicycle access on State Highways. NHDOT has adopted a policy to add width for shoulder bicycle routes when state highways are rebuilt, which happens on a 20-30 year cycle, though not as part of routine resurfacing, which runs on a 10-15 year cycle.

The Regional Transportation Needs Survey identified a need for improved bicycle and pedestrian facilities within communities that connect residential areas to schools and provide safe passage for students. Local interest in such school zone bike facilities Progress can be made in this area through the adoption of Safe Routes to School (SRTS) under SAFETEA-LU.

Supporting Facilities for Bicycles

Bicycling is greatly supported by the provision of secure racks at school, work and 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. The RPC also works with Seacoast Commuter Options, the regional Transportation Management Association (TMA) to promote the annual Bike/Walk to Work Day events.

Another important step is to support better connections between bicycles and other modes of transportation. This includes secure parking at bus stops and trains 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 of 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.

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 "Four Es" – Engineering (building bicycle routes) must be accompanied by efforts at Education (regarding cyclists rights and responsibilities), Encouragement (to try a new way to travel), and Enforcement (of traffic rules for both drivers and cyclists).

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. There is a significant need for companion efforts targeting older children, as well as adult cyclists and drivers. A nonprofit organization known as NH BikeSmart is currently piloting an outreach program for elementary school students with a curriculum also used in Maine and Vermont. This program developed in part out of work by the NHDOT Bicycle and Pedestrian Transportation Advisory Committee, which has recommended NHDOT funding for the initiative. Some program funding has been allocated through the new federal Safe Routes to School initiative (SRTS). SRTS is discussed in greater detail in the following section on Pedestrian Facilities and Program.

Greater effort is also necessary to enforce traffic laws related to bicycles. A lack of enforcement results in some cyclists putting themselves and others at risk. This causes resentment among drivers. Likewise, traffic enforcement to protect the rights of cyclists is rarely a priority.

Recent Progress

The 2002-2022 Plan identified several high priority portions of the bicycle network, including the Great Bay Loop and the Exeter-Hampton-North Hampton Loop. Projects constructed since the last plan are listed below.

- Development of a Corridor Plan for the Salem-Concord Bikeway, an off-shoot from the I93 corridor widening project
- Completion of the Windham segment of Salem-Concord Rail Trail, largely with private funding. CMAQ funding has also been secured for preliminary engineering of the Salem segment of the trail
- Completion of the Conceptual Design and Implementation Plan for the NH Seacoast Greenway (New Hampshire's segment of the East Coast Greenway).
- Designation and signing of the interim on-road route for the NH Seacoast Greenway, largely following NH Routes 1A and 1B.
- NH 27 shoulder bicycle routes in Exeter from downtown to the Hampton Town Line.
- NH 111 shoulder bicycle route in Kingston from 1000' west of Main Street, extending 0.5 miles westerly.
- NH 111 shoulder bicycle route in North Hampton between Hobbs Road and US1.
- Establishment of regional events for Bike/Walk to Work Day (BWWD) each May. The RPC and Seacoast Area Bicycle Routes (SABR) partnered in 2003 to coordinate the Seacoast's first Bike/Walk to Work Day, featuring SABR also partnered in 2005 on a NH Charitable Foundation grant project to expand BWWD statewide, resulting in six additional communities adopting initiatives (Littleton, Laconia, Keene, Manchester, Hanover, and Lebanon).
- Rehabilitation of the Memorial Bridge programmed, including a solid deck on the lift span, significantly improving safety for cyclists on this critical interstate crossing.
- Bicycle racks added to all COAST buses.

A final area of progress has been the establishment in 2005 of the Bike/Walk Alliance of New Hampshire (BWANH), a statewide bicycle advocacy group that will be a statewide voice for bicycle interests that can play a role in identifying routes, coalition building, raising private matching funds, and otherwise advocating for regional bicycle routes.

Issues and Problem Areas

There are a number of issues related to bicycle facilities and programs in the region.

Lack of Bicycle Facilities: While experienced cyclists are typically comfortable riding on roads with narrow shoulders and significant traffic, the lack of a shoulder bicycle route will often prevent younger riders or adults unaccustomed to riding from choosing to ride a bicycle for a short trip instead of driving. Significant progress has been made in recent years in developing regional bicycle routes such as the Great Bay Bicycle Loop, the Exeter-Hampton-North Hampton Loop, the Salem-Concord Bikeway, and constructing shoulder bicycle routes in various communities, projects tend to be developed in a piece-meal approach based on availability of local funds, or developer contributions. Bicycle and pedestrian accommodations are often only prioritized in highway projects in response to organized input from advocacy organizations, rather than as an integral component of roadway design. A response to this is the concept of *Complete Streets,* which emphasizes the idea that streets should be designed and operated to enable safe access for all users, whether drivers, transit riders, pedestrians, and bicyclists, as well as for older people, children, and people with disabilities. Complete Streets policies direct transportation planners and engineers to consistently design with all users in mind. They have been adopted by a few states (OR, VA, SC), and a number of regions and cities.

Lack of Bicycle Safety Education: Bicycle operators have most of the same rights and responsibilities as drivers of motor vehicles under state law, with limited exceptions such as riding on limited access

highways. Local policy makers often cite the lack of adherence to traffic rules by some bicyclists as a justification for not improving road conditions for bicycles. However, while most drivers must take a driver's education course before getting behind the wheel, there is no consistent statewide education program to teach children about the rules of the road for bicycling. Similarly, there is little consistency in the enforcement of traffic rules on bicyclists. Maine and Vermont have successful statewide education programs targeting students in grades 4-5 teaching rules of the road and safe cycling. NH BikeSmart is an outreach initiative based on the Maine and Vermont programs, though as of 2008 reaches only a limited number of schools. The combination of a consistent education program and consistent enforcement of traffic rules related to bicycles would be a valuable step for improving bicycle safety statewide.

3.6 Pedestrian Facilities and Programs

Pedestrian Facilities

In the RPC region, pedestrian facilities vary considerably from community to community. Exeter and Portsmouth feature traditional downtowns, which favor the pedestrian and thus 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.

In more rural communities residents are compelled to use the roadway for foot travel. This can be made somewhat safer when shoulder lanes are available for use. In general, less developed communities in the region give pedestrian issues less consideration, with the exception of facilities for recreational use. Many communities readily acknowledge that particular roadway segments are used frequently by pedestrians and that the provision of pedestrian facilities will play an important role in future growth. 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 is implementing 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 construct facilities for pedestrians. The TE program is the primary source of federal funding assistance for sidewalk construction used in New Hampshire. However, these funds are limited, highly competitive, and the delay in accessing funding has grown.

Pedestrian Programs

Another potential source of funding for pedestrian facilities is the Safe Routes to School program initiated under SAFETEA-LU. While funding for this program amounts to just $1,000,000 annually statewide, the launch of the program has led to Safe Routes to School Task Forces being developed in several RPC communities already, including Portsmouth, Rye, and North Hampton, and other towns are likely to follow suit. A related program designed to encourage walking among school children is the NH DHHS' Kid Power program, an adaptation of the Center for Disease Control's KidsWalk initiative. The value of these programs as a catalyst for spurring local discussion on pedestrian safety, and supporting

walking through encouragement, education, parental volunteer involvement, and stepped up enforcement of traffic laws, outweighs the dollar value of grants available.

Recent Progress

The 2003-2022 Plan identified several local sidewalk projects that had been funded through the Transportation Enhancement or Congestion Mitigation/Air Quality programs. Projects programmed or constructed since the last plan are listed below.

- Portsmouth Riverwalk - Boardwalk along Portsmouth harbor along the back side of Bow Street, as well as sidewalks along Market Street Extension connecting Spinnaker Point and Atlantic Heights to Downtown. (Programmed)
- Town Center sidewalk in Sandown - Project was subsequently cancelled when the Town voted not to appropriate matching funding and turned back the TE funding. (Cancelled)
- Town Center sidewalk in North Hampton – Sidewalk will connect the Middle School to the Town Library (Programmed)
- SAFEPATH initiative in New Castle – Two part project including a multi-use path connecting the Wentworth hotel and residential area to the New Castle Common, and sidewalk on NH1B connecting Trefethen School to adjacent residential neighborhoods. (Programmed)
- Windham Rail Trail – Privately funded segment of proposed Salem-Concord rail-trail running from Windham Depot to NH Route 111. (Completed)

Issues and Problem Areas

There are a number of issues related to pedestrian facilities and programs in the region.

Obstacles to Pedestrian Safety: As noted above, many communities in the RPC region lack sidewalks and other pedestrian facilities. This not only discourages walking, it makes it unsafe for those who do choose to walk. While many rural and suburban communities traditionally lacked sidewalks, as development, traffic volumes, and traffic speeds have increased many towns have yet to respond with improvements to pedestrian safety, given the cost of building and maintaining sidewalks. Beyond the lack of infrastructure, many barriers exist which discourage walking or create unsafe conditions for pedestrians. Land use influences pedestrian travel greatly. New residential development is typically far removed from town centers where retail shops, schools, or other community services are located. Even where residential development is adjacent to town centers, the widespread use of cul de sacs often means that neighborhood residents need to walk a long circuitous route to reach a destination that may be close as the crow flies.

Auto-oriented strip development that exists on many roads creates an inhospitable and often unsafe environment for pedestrians. New commercial developments are typically designed with large parking lots that offer no marked pedestrian access from the street to the building entrance. This requires pedestrians to dodge cars pulling into and out of parking spaces whose drivers are focused on spotting a space rather than keeping an eye out for people on foot.

Chapter 2: Regional Transportation Vision

1. The Goal of the Plan

This chapter lists the stated policies of the Rockingham Planning Commission which are used to guide the development and maintenance of the transportation network, including the selection of future improvement projects and to provide guidance to the Planning Commission towards achieving the regional goals through the transportation planning process. These goals have evolved over the years based upon Federal requirements as well as input from the Technical Advisory and Policy Committees and the interested public.

The overarching goal of the Transportation Plan is to develop a safe, cost-effective multi-modal transportation system that ensures adequate mobility to all persons, enhances the quality of life in the region, supports sustainable development patterns and economic growth, and makes a meaningful contribution towards achieving the natural resources goals of the region. The individual policies that are listed recognize the need for a balance between safety, security, mobility and accessibility, cost, and environmental impact.

1.1 Regional Transportation Goals and Policies

The Metropolitan Planning Organization is primarily a regional transportation policy body that assists in directing transportation funding and prioritizing regional transportation projects.

Throughout the Policies and Objectives section the term transportation system shall mean the entirety of all modes of transportation and all supporting infrastructure necessary to make use of the transportation system. Included are all highways, rail lines, waterways, pipelines, airports, bike paths, pedestrian ways (sidewalks and trails), transportation terminals (people and freight), bridges, tunnels, signage, parking, and drainage infrastructure. It may be used to represent a small geographic area such as a community center or a large regional area such as Rockingham County, the State of New Hampshire, or New England.

Throughout the Policies and Objectives section the term transportation corridor shall mean a wide geographic area that includes highways, waterways, and railways.

Goal 1: TRANSPORTATION PLANNING: *Implement an effective, integrated land use and transportation planning process that facilitates sustainable development patterns and economic growth; supports a high quality of life; and preserves cultural, historic, and natural resources.*

The process shall be based on consultation, coordination, and cooperation between all stakeholders including the public, local governments, regional agencies, state agencies, federal agencies, and transit providers.

Policy 1.1: *Ensure that development of the transportation system supports the achievement of federal air quality standards, consistent with the requirements of the Clean Air Act Amendments of 1990 and the State Implementation Plan.*

Policy 1.2: *Use transportation project programming to encourage development patterns and public facility investments that allow residents and visitors to live, work and recreate without having to drive.*

Policy 1.3: *Encourage the expansion of public transportation services, ridesharing programs, park and ride facilities and other transportation demand management initiatives in the region.*

Policy 1.4: *Work with communities and the NHDOT to plan and develop projects, designs, and initiatives that promote a shared, safe transportation system for bicyclists, motorists, transit users, and pedestrians.*

Policy 1.5: *Improve the transport of people and goods through development and maintenance of intermodal connections between transportation facilities including: highways, airports, pipelines, seaports, public transportation networks and rail lines.*

Policy 1.6: *Encourage the protection of natural resources (wetlands, aquifers, wildlife habitat, woodlands, agricultural lands, scenic values, etc.); cultural and historic resources; and recreational resources in the design of transportation system changes. Require appropriate mitigation for unavoidable impacts.*

Policy 1.7: *Promote projects that improve existing facilities over those that develop new roadways; and encourage multiple uses of rights of way when possible.*

Policy 1.8: *Evaluate transportation system improvements for their impact on interstate and regional travel patterns.*

Policy 1.9: *Encourage transportation investments that facilitate tourism in the region.*

Policy 1.10: *Promote coordination among municipalities in planning for natural hazard mitigation, emergency management, and evacuation routes, with special attention to communities surrounding Seabrook Station. Incorporate consideration for evacuation routes into the project prioritization process.*

Policy 1.11: *Coordinate with transit operators, and federal, state, regional, and local agencies and officials to enhance the safety and security of the transportation system.*

Policy 1.12: *Coordinate with freight operators (rail and highway) and agencies on projects to enhance the security of the freight transportation system in the region.*

Goal 2: ENGAGING THE PUBLIC*: Implement outreach initiatives to increase public understanding of the transportation system and engage all members of the public in the transportation planning process.*

Policy 2.1: *Ensure the transportation planning process is executed in accordance with interagency agreements outlined in the MPO Prospectus, consultation processes specified in Title 40 (Code of Federal Regulations Part 93), and the NH Code of Administrative Rules Env-A 1500-Conformity.*

Policy 2.2: *Actively solicit participation in the transportation planning process from all members of the public, with special emphasis on under-represented groups.*

Policy 2.3: *Use the MPO Public Participation Process to promote public understanding of the transportation system and its connections to land development, water quality and air quality issues.*

Policy 2.4: *Engage local and state policy makers in the transportation planning process and encourage their support of progressive transportation legislation.*

Policy 2.5: *Provide information to local agencies, organizations, schools, and the general public on transportation safety issues including those associated with emergency evacuation.*

Policy 2.6: *Promote awareness and enforcement of traffic laws related to bicycles and pedestrians.*

Goal 3: TRANSPORTATION SYSTEM ATTRIBUTES: *Develop a transportation system that moves goods and provides universal access for all residents and visitors to employment centers, housing areas, shopping areas, professional services, entertainment and sports venues, and recreation areas in a manner that is efficient and safe.*

Policy 3.1: *Support development of transportation facilities and services that meet the needs all residents and visitors, with special care taken to meet the needs of the elderly, individuals with disabilities, and those who do not drive.*

Policy 3.2: *Ensure that all components of the region's transportation system are well-integrated, efficient and user-friendly.*

Policy 3.3: *Facilitate regional coordination of demand response human service transportation and public transit service offered by COAST and CART.*

Policy 3.4: *Identify and implement operational and management strategies to improve the performance of the existing transportation facilities, relieve vehicular congestion, and maximize the safety and mobility of people and goods.*

Policy 3.5: *Encourage effective and proper maintenance of state and local facilities supporting all modes of transportation.*

Policy 3.6: *Encourage communities to work cooperatively in planning and prioritizing transportation projects, in developing and implementing consistent access management standards, and in developing zoning that is compatible across community lines.*

Policy 3.7: *Promote energy conservation in the movement of people and goods, including support for the development and implementation of alternative fuels (and alternative methods of using those fuels) that have a positive environmental impact.*

Policy 3.8: *Utilize new technologies to reduce congestion, improve traffic flow, and enhance public transportation.*

Policy 3.9: *Minimize the impacts of through traffic on neighborhoods, commercial areas, and local roads by maximizing the use of primary transportation corridors and employing techniques such as traffic calming.*

Policy 3.10: *Work with communities and NHDOT to identify current and potential deficiencies and threats to the economic vitality of the region that relate to transportation, and work to mitigate those deficiencies and threats.*

Goal 4: TRANSPORTATION SYSTEM FUNDING: *Develop adequate and predictable funding streams to address regional transportation needs.*

Policy 4.1: *Encourage cooperation between public, private, and non-profit organizations in the development, funding, and management of transportation projects.*

Policy 4.2: *Work with federal, county, state and local policy makers to provide continuous, dedicated, funding assistance for public transportation.*

Policy 4.3: *Work with communities to secure funding for local and regional transportation projects.*

Policy 4.4: *Work with NHDOT and communities with designated Urban Compact zones to develop more equitable funding apportionments.*

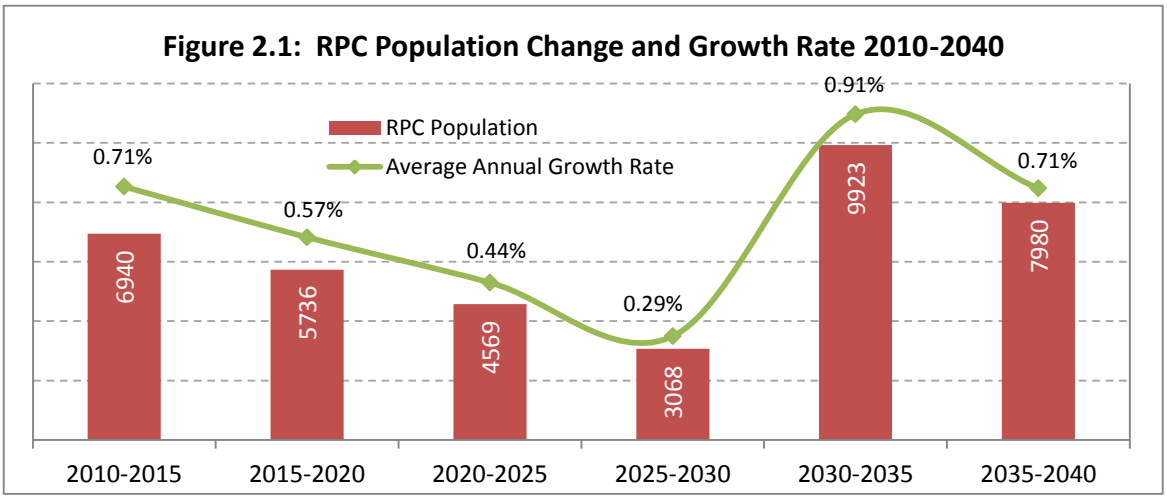
2. Regional Growth and Forecasting

The future transportation system is heavily dependent upon the type and location of growth in the regions' communities. To gain insight to congestion issues in the future, a projection of growth in employment and population was undertaken for the plan horizon year.

2.1 Methodology

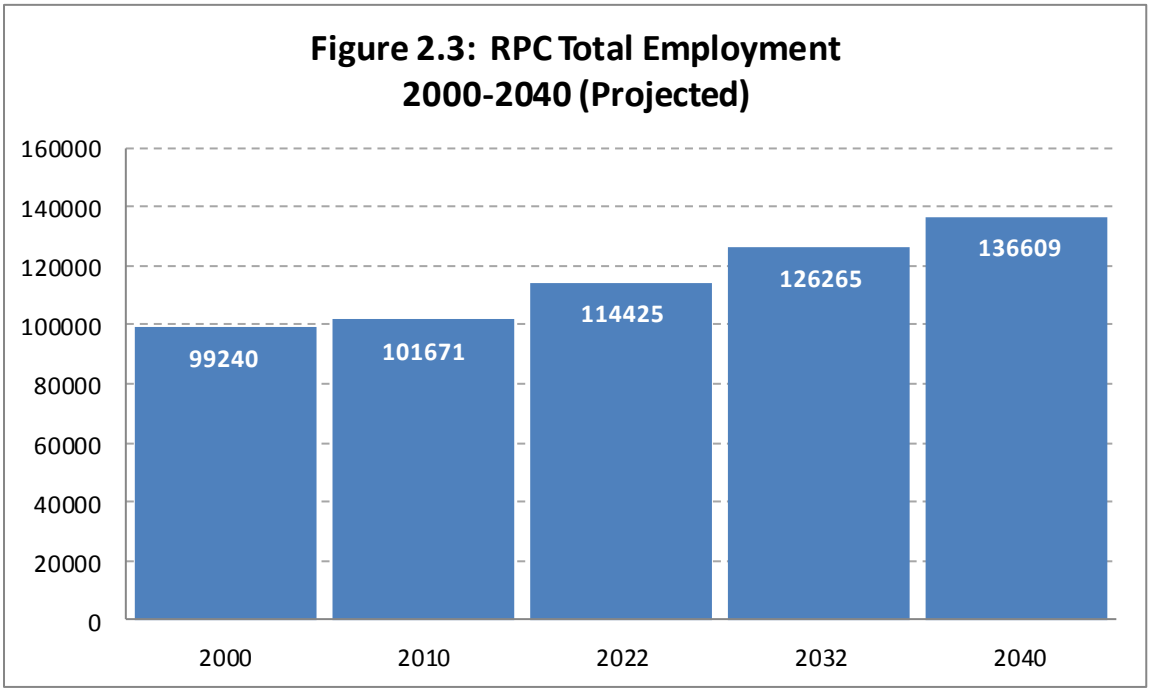
Growth for Population was calculated utilizing a Cohort-component model developed by the State of New Hampshire and used by the Office of Energy and Planning to perform annual projections. In the RPC region, use of this model produced a growth rate of approximately 0.6% per year for the region over the 2010 to 2040 timeframe, for a total growth of about 38,000 new residents. As with many places in the United States, the region is seeing a significant demographic shift. The "Baby Boomers" are moving into the older age cohorts and those behind them are smaller in size. As the number of "Baby Boomers" shrink, a natural counter to migration will exist in the region that will keep population growth low until around 2030 when it should begin to grow at a faster pace. This change in the regional growth rate is reflected in ***Figure 2.1*** below.

Figure 2.1: RPC Population Change and Growth Rate 2010-2040



Regional Employment

Employment numbers were gathered from Department of Employment Security reports for every two year period from 1990 to 2010. In some cases the number of jobs in small communities had to be estimated based on earlier or later data as employment levels were missing due to confidentiality concerns. This provided insight into the past growth and distribution of jobs. The Department of Employment Security Statewide Employment Projections for 2010-2020 provide a statewide growth in employment by 10.6% over the ten years and this number was applied to the region giving an employment growth rate of approximately 1% per year. As an employment projection was needed out to 2040, the State projection was extended out to the horizon year of the plan. It was also assumed that both the distribution of total employment in the region, and the rate of growth, would remain the same as the state.

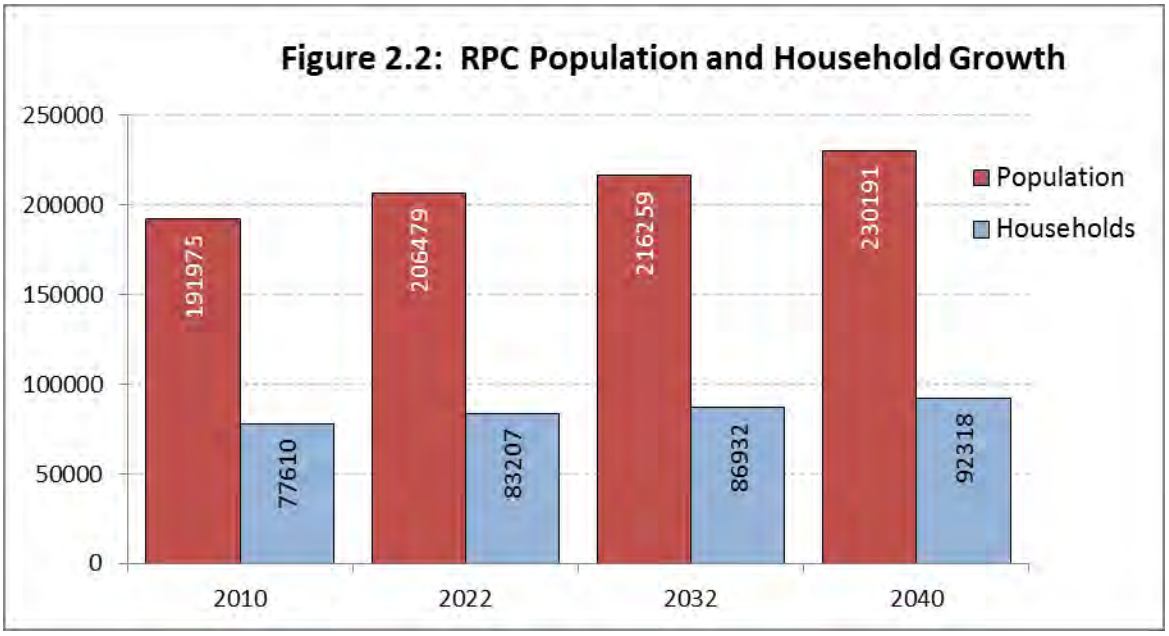


2.2 Growth Projection

The models above were utilized to project population and employment levels for the horizon year of the Long Range Transportation Plan (2040). Overall, an Average Annualized Growth Rate of 0.6% per year was produced for population and 1.0% for employment although as shown in the figures above, each is a rate that declines over time as the region grows.

Table 2.1: Employment and Population model Outputs for the RPC Region

	2010	2022	2032	2040
Population	191,975	206,479	216,259	230,191
Housing	77,610	83,207	86,932	92,318
Employment	101,671	114,425	126,265	136,609



3. Regional Travel Demand Modeling

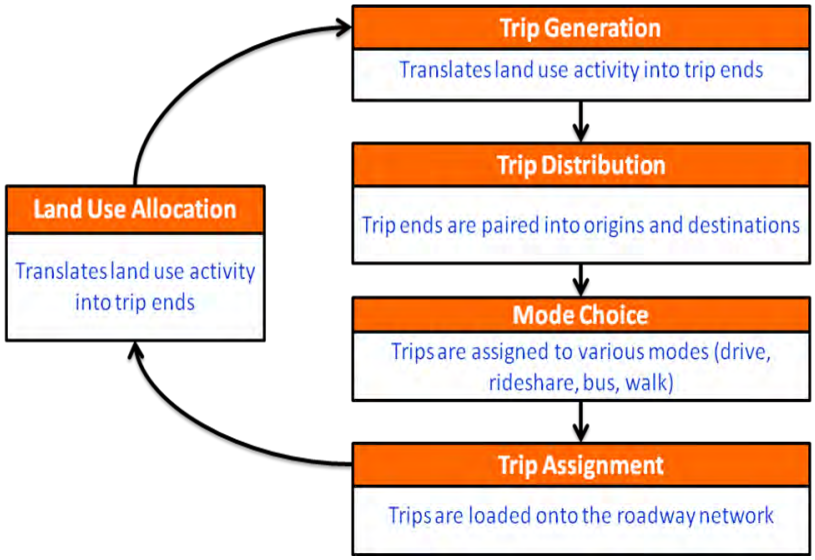
3.1 Introduction

The outcomes of the growth projections are utilized in the joint RPC/SRPC Regional Travel Demand Model to assign population and housing to the various parts of the region, and from that develop estimates of future travel on the roadways in the model area as well as amount of pollutants emitted. The model can show areas of current and future congestion that can be utilized in determining future project needs.

3.2 Model Summary

The Rockingham and Strafford MPO use a standard four step Transportation Model with a fifth step added to allocate land use. The model is TransCAD based, and utilizes a set of macros and routines prepared by Resource Systems Group to integrate the land use allocation and tailor the process to the region. Baseline land use inputs are assigned for each traffic analysis zone (taz) in two housing categories (single family and multifamily) and six employment categories (low commercial, hi commercial, retail, industrial, institutional and hotel/motel) based on information collected from the Census, the New Hampshire Department of Employment Security, the New Hampshire Office of Energy and Planning, and the communities.

Figure 2.5: 5 Step Regional Travel Demand Model



Future year employment and housing for the region is derived from the outputs of the growth projections described in this chapter, and is distributed to the sub-areas of the model to establish an overall growth for each area without determining where exactly within that area the growth occurs. The Land Use Allocation module assigns growth to the specific traffic analysis zones within each sub-area, except in locations where growth is specifically restricted (for example the Pease Tradeport). Known land use restrictions (zoning and environmental) are accounted for, and the new land use is placed into specific zones based on an algorithm that takes into account preexisting land uses (what is there already) in the zone, and its accessibility from all other zones (how easy is it to get there). The process is iterative and builds on past growth levels and patterns.

The RPC is exploring the capabilities of the model to perform various types of analysis such as scenario planning, and as such the tools and methods that are being used are being developed and refined as work is done. For that reason, analysis is somewhat limited in this iteration of the Plan and the goal is to improve both the capabilities of the model and our analysis methods in this area.

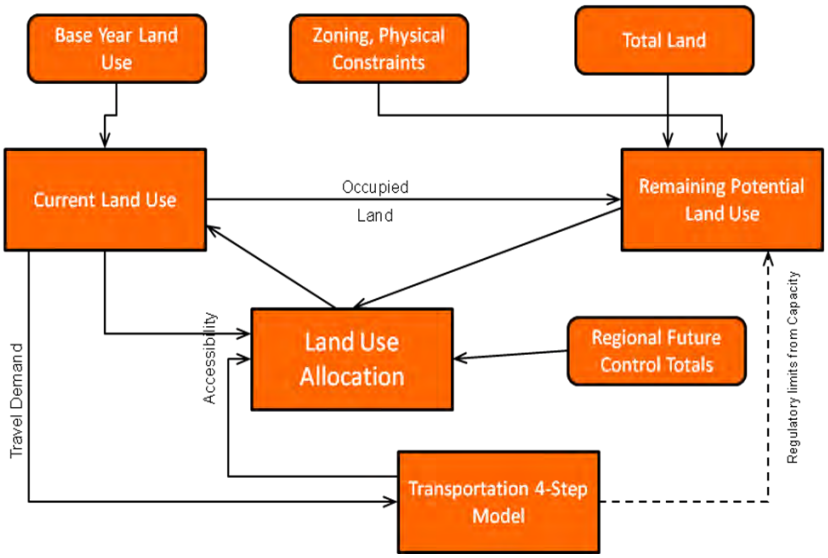
3.3 Growth Scenario

For the purposes of the Long Range Plan, three basic scenarios were developed and are described below. As work was progressing on this aspect of the Plan, limitations in the Regional Travel Demand Model became apparent and it was difficult to extract the data from the model in ways that are useful. This has limited the analysis that we were able to do with the scenarios described in this section of the Plan. Staff is working to overcome these problems but for this plan, the scenario planning analysis will be limited to a general comparison between the existing growth pattern and a compact growth pattern and the potential impacts that they have. Future revisions of the Plan will include more detailed analysis and additional work with other scenarios as they are available. This analysis will also be included in the Regional Master Plan for the RPC region which is expected to be completed in 2009.

Existing Growth Pattern

Growth within the RPC region is likely to continue growing in the same pattern that it has in the past and the distribution of land in this scenario reflects that by placing most growth outside of community centers. This means that commercial growth will frequently come as strip development and big box stores. Residential development will continue to be based on large lot zoning which many communities feel helps maintain a rural feel. However, it also encourages the further development of farmland and forests in order to have enough land to meet zoning requirements. Residential development will continue the present trend of private, unconnected subdivisions containing high-end homes. Many of

Figure 2.6: RPC Model Land Use Allocation Process



the residents in these communities work in Manchester, Concord and Massachusetts and will commute daily to their jobs. Commuting will continue to be primarily by car. Ridership on buses and on the Downeaster may increase if fuel prices continue to rise or congestion worsens. Though low density development will continue to make public transportation difficult to achieve as well as discouraging pedestrian and bicycle travel.

This development pattern obliges municipalities to build new roads, sewer, and utilities infrastructure. It will also allow people to live in neighborhoods that accommodate commuting by automobiles and prioritize separation from commercial activity and privacy. Large lots will contribute to keeping land prices high, making it more expensive for those towns who wish to place land in conservation easements. Low density development will continue to make public transportation difficult to achieve as well as discouraging pedestrian and bicycle travel.

Land Use Impacts

The land use impacts of the current development pattern continue to place most growth outside of the town centers of the communities. Overall, there is a 18.95% growth in housing units between 2010 and 2040 and a 34.4% growth in Employment. This growth is spread throughout the community with about 15.5% of housing and 56% of employment directed to the community centers. Overall, this pattern of growth continues the trend of increased housing and employment in the suburban areas of communities and a decline portion in town centers.

Transportation Impacts

The outputs of the model utilizing the standard land use and growth pattern show a total increase of approximately 1.8 million vehicle miles of travel (VMT) per day over the life of the Plan (2013-2040). This is a very moderate 0.8% per year average annual growth rate and shows the network performing well overall, although additional congestion is seen in a few areas.

Table 2.2: Distribution of Employment and Housing under Existing Pattern Scenario

	Town Centers	Suburbs	Other*	
Base Year (2010)				
Housing	35.5%	61.5%	2.9%	77,610 Housing Units
Employment	55.6%	42.7%	1.8%	101,671 Employees
2040 – Existing Pattern				
Housing	31.4%	65.7%	3.0%	92,318 Housing Units
Employment	53.2%	44.9%	1.8%	136,609 Employees

*There are a few TAZs in the model area where for various reasons the land use was not modified for any scenarios

4. Needs Assessment

The intent of this section of the Plan is to provide some assessment of the needs of the transportation system based on data analysis from modeling efforts as well as input from the public, RPC TAC and Policy committee members, transportation agencies, and staff. In future iterations of the plan, the intent will be to also make comparisons between land use/transportation scenarios regarding system needs. However, given the limited progress that was completed on the scenario planning, this type of comparative analysis is not possible at this time.

4.1 Economic Vitality

Continued economic success in the region will rely upon the quality of the transportation network. Many of the projects included in the Long Range Plan will have beneficial impacts toward this success by providing improved mobility through currently congested areas of the region and in some cases will improve accessibility to employment. There are some areas that still need to be addressed however:

- An examination of tourist travel in the region and the transportation improvements necessary to maintain this economic base for the region
- An examination of the potential to improve the economic situation of residents by improving access to jobs through public transportation.
- Exploration of the contributions of the freight system to the local economy and identification of deficiencies in that system.

4.2 Safety

Safety is an issue of primary concern within the region and statewide. NH DOT has recently developed a Strategic Highway Safety Plan, and is implementing the Highway Safety Improvement Program (HSIP). Both of these programs have the potential to address many roadway safety issues in the region, particularly relating to intersections. Already being considered for short-term implementation are three sites in RPC communities that will mitigate problems on NH 33 (Bayside Road/Winnicut Road) and NH 125 (North Road and Middle Road). However, there are many other locations that remain significant safety problems and little consideration of pedestrian and bicyclist safety or of addressing corridor safety issues. Safety needs for the region include the following:

- Improved crash data and access to crash data for analysis.
- Expand the use of Access Management as a strategy to address safety issues on roadways.
- Evaluation of the safety of statewide and regional bicycle routes
- Include bicycle and pedestrian improvements in roadway projects and focus on “complete streets” by designing for all users.

4.3 Security

Security incidents on the transportation network are rare in the region. In general, travelers feel that roadways, bridges, and transit stations are safe and NH DOT is working with safety and security agencies

to implement Incident Management Systems relating to major highway corridors and critical structures. Recent natural disasters have raised concerns about the ability of the transportation network to function under adverse conditions however, and addressing this is a significant issue for the region. For addressing security issues, the region needs the following:

- Determine the role the RPC will have in regional security planning for the transportation system.
- An evaluation of the capacity of coastal evacuation routes to carry the volumes necessary to quickly remove the populace from danger.
- An evaluation of the impact of flooding on evacuation routes and the transportation network as a whole.
- An evaluation of the impacts of continued growth on evacuation routes.

4.4 Accessibility and Mobility

Accessibility is concerned with the ability of individuals to reach desired goods, services, activities and destinations, and this is a great concern in the RPC region. While regional accessibility is excellent for individuals with a motor vehicle, public transportation in the area is extremely limited and this has a significant impact on the ability of those without a motor vehicle to get to work, perform errands, or travel for other reasons. The disparity in assistance from the State of NH in providing non-federal match for highway projects but not transit operations is a significant equity issue in the state and region. Recent additions to public transit in the form of the development of the CART system in the western part of the region, and the near term expansion by COAST of transit along the Spaulding Turnpike and I-93 corridors will play a large role in extending the access to transit that is necessary to improve accessibility in the region. That being said, there is still only limited transit access to major employment centers such as Exeter, Hampton, Seabrook, and Salem and much of the current service runs along the Interstate to connect to major employment centers in Massachusetts. Needed accessibility improvements in the region include:

- Local transit routes on corridors such as NH 28 and US 1.
- East-west connections on transit along the NH 101 corridor.
- Development of a dedicated stream of State matching funding for transit operations on par with matching funding for highway projects

Mobility is the physical movement from one place to another via, and examining the transportation system from this perspective defines problems in terms of constraints on that movement primarily in the form of capacity limitations to roadways, transit systems, and parking; and looks for solutions that reduce travel times and delays. In this regard, the regional transportation system has a number of capacity constraints, many of which are being addressed by projects included in Chapter 3 of this Plan. Major capacity improvement projects on Interstate 93, NH 16, and NH 125 will significantly improve mobility on those corridors. Mobility enhancing needs in the region include:

- Additional capacity for parking at the Exeter Train Station
- Additional park and ride capacity along the I-95 corridor
- Additional capacity at the Hampton Tolls on I-95
- Additional parking capacity near the beaches.
- Increased capacity at choke points to get to the coastal region.
- Access Management on major corridors such as NH 28, US 1, and NH 125.

4.5 Environmental Protection, Energy Conservation & Quality of Life

Improving integration in planning for transportation system improvements, land use and environmental projection has been an increasing priority for the RPC in recent years. The LRTP draws on the recently completed NH Wildlife Action Plan, Coastal Conservation Plan and the NH Natural Services Network to incorporate information about critical environmental resources in the region that may be impacted by transportation projects. Similarly, the RPC Regional Master Plan and RPC land use staff emphasize to communities in the MPO region the value of compact, mixed use, multi-density settlement patterns that reduce the rate of land consumption, protect critical habitat and other ecosystem functions, and support transportation by means other than the automobile - in the process reduce energy consumption and pollutant emission. Much work remains to be done to improve regional cooperation, encourage adoption of innovative land use policies at the local level, provide technical assistance to communities, and improve multimodal transportation options throughout the region. The MPO can and should play a strong advocacy and educational role in moving these initiatives forward at the state level and within member communities.

- Expand outreach and technical assistance to communities to encourage implementation of Smart Growth principles in local land-use and economic development planning
- Support implementation of the Context Sensitive Solutions (CSS) design approach on projects within the MPO region.
- Expand multi-modal alternatives at the local and regional level

4.6 Integration and Connectivity

A key requirement of the transportation planning process is to enhance the integration and connectivity of the transportation system, across and between modes for people and freight. This will involve not only addressing the various modes of transportation, but also the land use issues typically dealt with by the individual communities. Critical needs in this area include:

- Ensuring that intermodal connections exist and have adequate capacity within the regional freight network.
- Working with communities to address the impact of land use decisions on the transportation system and individual transportation needs in the region.
- Ensuring that roadway improvement projects take a “complete streets” approach to design and address the needs of all roadway users.
- Expansion of the capabilities to perform transit and freight analysis with the regional travel demand model.

4.7 Management and Operations Reliability

The reliability of the transportation network plays a large role in people’s lives as in many cases, it determines how and when they travel to work, when and where they choose to go shopping, and to some extent where they live. Effective management and operations of the transportation system optimizing the performance of the existing infrastructure and improves the reliability of the system locally, regionally, and statewide. Addressing management and operations needs is one role of the MPO and the following needs have been identified:

- Identify areas where operations issues are creating reliability issues and develop solutions.
- Identify multi-jurisdictional management and operations programs that should involve the MPO.
- Identify regional management and operations analyses that the MPO can conduct utilizing the regional travel demand model or other resources.

4.8 System Preservation

One area of need that has become more and more apparent is related to the operation and maintenance of the existing highway network and bridges. The transportation infrastructure in the region, and in New Hampshire as a whole, is aging and in need of additional investment to simply maintain what already exists. NH DOT has stated that approximately 45% of the resources available for roadway work will need to go towards maintaining the existing roadway and bridge network.

- Compilation of bridge and pavement conditions to determine regional preservation priorities on both the state and local systems
- Analysis of funding opportunities to more completely maintain

Chapter 3: The Constrained Transportation Plan

This chapter contains the fiscally constrained project list for the Long Range Transportation Plan. Also included in this chapter is a discussion of the impacts of the projects on the various planning factors as well as potential environmental mitigation strategies.

1. Projects and Finances

For purposes of implementing the provisions of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy of Users (SAFETEA-LU) legislation, 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 SAFETEA-LU 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 450.322(f)(10):

(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. Starting December 11, 2007, 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 Transportation Control Measures (TCMs) in the applicable SIP. TCMs are specific strategies that can be identified and committed to in the SIP to reduce air pollution are and are either listed in Section 108 of the Clean Air Act (CAA), or will reduce transportation-related emissions by reducing vehicle use or improving traffic flow.

(vii) For illustrative purposes, the financial plan may (but is not required to) 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.

1.1 Revenue Sources and Anticipated Revenues

As shown in ***Table 3.1***, Revenues for transportation improvement projects were estimated using information provided by NHDOT regarding expected Federal and State funding for the 2012-2022 10 Year plan and extrapolated out to the 2040 horizon year. A 3.2% per year rate of inflation is used to estimate both year of construction costs, and future revenues. To determine the RPCs "share" of the funding the percentage of state population (14.5%) and federal funding eligible lane miles of roadway (12%) were calculated for the region. These two values were averaged (13.3%) and applied to the total funding available to obtain both an annual and a total allocation for projects within the RPC boundaries. Due to the fact that NH DOT does not program the State 10 Year Plan with regional budgets in mind, there is often an imbalance between the expected "share" of resources and the actual expenditures in the region. The MPO adjusts for that by offsetting years of higher than usual programming with years of lower funding with the goal of staying close to the 13.3 percent of total revenues.

Table 3.1 also 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 FY2007-FY2009 identified in SAFETEA-LU, future allocations are forecast to increase 5% annually, which is within the range of annual increases under SAFETEA-LU. 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 funding, implementation of new services is also dependent on local support from communities served by the systems.

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 ***Table 3.2*** 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. ***Table 3.2*** also includes an estimate of municipal funding available to maintenance, operations, and improvements locally that is derived from the 2006 and 2007 annual community reports that include budgets for highways as well as warrant article and Capital Improvement Program (CIP) appropriations for transportation projects. The budgetary numbers for each community are shown in ***Table 3.3***. Funds from the communities were totaled and divided by the total miles of locally maintained roadways to get an average per mile expenditure ($12,178). This number was then applied as the starting point for the Estimate of local road maintenance and operations needs in ***Table 3.2***. This value was inflated at the same rate as the state per mile cost to create an estimate of future local funds needed and then combined with State funds to obtain an estimate of total maintenance and operations needs for the region.

1.2 Anticipated Costs

The transportation projects included in the Long Range Plan include order of magnitude estimates of the construction costs of each project as well as overall considerations for engineering costs. Those projects in the Transportation Improvement Program (TIP) are the first four years of the Plan and include right-of-way and engineering cost estimates as well as more accurate construction costs. The TIP projects are shown in detail in ***Table 3.5*** and Plan projects in ***Table 3.6***.

Project costs for the Transportation Improvement Program are taken directly from the year of expenditure inflated values included in the 2009-2012 State Transportation Improvement Program (STIP). As the State of New Hampshire does not sub-allocate funds to the MPOs for programming the TIPs, the assumption is that since the STIP is fiscally constrained, and the MPO TIP is directly derived from that document, it must therefore be fiscally constrained as well.

While the financial picture for the remainder of the Plan is less clear than that of the TIP, the costs associated with the listed projects are within the estimates of funding available to the region based on the methodology described in Section 1.1 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 and provides a balance of just over $22 million available for Right-Of-Way, inflation, and other cost increases associated with the listed projects.

1.3 Fiscally constrained projects lists

The projects for the 2040 Long Range Plan are divided into two tables. The first is the 2013-2016 Transportation Improvement Program (TIP) and the second is the remaining years of the Plan out to 2040. Each of these tables is described in more detail below.

Transportation Improvement Program (TIP)

The 2013-2016 Transportation Improvement Program is shown in ***Table 3.5*** and is organized with regional highway and transit projects listed first, followed by "Statewide" projects and programs. The listing for each project includes the location, scope of work, Clean Air Act (CAA) code, funding category, phases included, and funding listed by fiscal year and by source (including matching funds). The projects can also be seen on ***Map 4***. The costs of the projects are year-of-expenditure estimates taken directly from the NH DOT database for the 2013-2016 STIP. Total spending on Transit, Highways, and Statewide projects are listed at the end of each type of project.

Transportation Plan Projects

Those projects not in the 2013-2016 TIP are listed in the Transportation Plan project listing which covers the years from 2017 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 ***Table 3.6***, includes the community that the project is occurring in, any assigned project number (for those projects in the State 10 Year Plan), the primary funding source, project location, and scope. Also included for each project is a base cost, which is the initial estimate of the project, as well as the year that the estimate was done. A year (or years) of construction is listed the year of construction cost

Table 3.4: Fiscal Constraint Summary

Document		Total Estimated Cost	Estimated Funding Available	Balance Available*
TIP (2013-2016)				
	Highways	$ 536,841,183	$ 536,841,183	$ 0
	Transit	$ 15,790,684	$ 15,790,684	$ 0
	Statewide	$ 29,341,040	$ 29,341,040	$ 0
Remainder of Ten Year Plan (2017-2022)				
	Highways	$ 210,421,000	$ 210,421,000	$ 0
	Transit	$ 23,925,931	$ 23,925,931	$ 0
	Statewide	$ 52,447,930	$ 52,447,930	$ 0
Remainder of Plan (2023-2040)				
	Highways	$ 457,092,802	$ 457,569,494	$ 42,305,047
	Transit	$ 101,214,232	$ 101,214,232	$ 0

* Balance available is an estimate based on current programming of projects and maintaining an approximate 13.3% of Federal Transportation funding resources. Also assumes inflation of costs and revenues at 3.2% per year. At least a portion of the funding available could be used for transit, bicycle, and pedestrian projects.

estimate in the final column inflates the base cost to the year of construction at 3.2% per year compounded. Transit projects are listed first followed by highway projects. Like the TIP projects, these are shown on ***Map 4*** as well.

1.4 Unfunded Projects

There are a few projects in the Plan project listing that have no cost estimates associated with them. These are projects for which no cost estimate is available or the scope and need is unclear and are included in the listing 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. With the exception of the Wall Street project which is awaiting the completion of a feasibility study, the remaining projects have either no estimate available or questions regarding their scope and purpose. The projects are:

- Pedestrian Improvements from Amtrak station to Downtown in Exeter – no cost estimate.
- Washington Street Traffic Calming in Exeter – no cost estimate.
- Martin Road Bridge over Piscassic River in Fremont – no cost estimate.
- Scribner Road bridge over Exeter River in Fremont – no cost estimate.
- Capacity improvements and shoulders on NH 121A from Hampstead to Sandown – scope unclear and no cost estimate available.
- Ocean Blvd pedestrian improvements in Hampton – scope unclear and no cost estimate available.
- US Route 1 Bypass in Hampton – Needs impact and feasibility study.

- New Road Bridge over B&M railroad in Newfields – no cost estimate available.
- B&M bridge over Barlett Street in Portsmouth – no cost estimate available.
- NH 1A bridge over Sagamore Creek in Portsmouth – no cost estimate available.
- New transportation corridor between Bartlett & Maplewood Avenues – Needs feasibility study.
- Wall Street extension in Windham – no cost estimate available. Awaiting outcome of Wall St study.

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

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Project Cost: Engineering	Right-of-Way	Construction	Cost Total
Atkinson [-] [6021001]: Hilldale Ave -- Hilldale Ave Improvements							
	Upgrade Hilldale Avenue in Atkinson	2037	2039	$ 80,626	$ 83,206	$ 686,947	$ 850,779
Atkinson-Hampstead [-] [6001001]: NH 111 -- NH 111 Reconstruction							
	Reconstruct NH 111 from Central Street in Hampstead to the southernmost Atkinson / Hampstead town line (3.2 Miles)	2026	2029	$ 1,561,154	$ 1,611,111	$ 13,960,444	$ 17,132,709
Boston Express - I-93 [-] [BE-1]: TRANSIT -- Boston Express bus capital							
	Commuter Bus Capital	2019	2019	$ 175,590	$ -	$ -	$ 175,590
Boston Express - I-93 [10418 L] [BE-2]: TRANSIT -- Boston Express operation support							
	Implement And Provide Operational Support For Expanded Commuter Bus Service	2019	2019	$ 600,000	$ -	$ -	$ 600,000
Brentwood [-] [6055001]: North Road -- North Rd/Prescott Rd. Intersection realignment							
	Realign the intersection of Prescott Road and North road from a "Y" alignment to a "T" alignment	2037	2039	$ 19,197	$ 19,811	$ 163,559	$ 202,566
Brentwood [-] [6055002]: NH 111A -- NH 111A/ Pickpocket Rd. Intersection realignment							
	Reconfigure the intersection of NH 111A and Pickpocket Road from a "Y" to a "T" alignment	2037	2039	$ 19,197	$ 19,811	$ 163,559	$ 202,566
Brentwood [-] [6055003]: Crawley Falls Road -- Crawley Falls Rd Bridge Replacement							
	Rehabilitate or Replace Structurally deficient bridge (073/065)	2030	2032	$ 737,825	$ 761,435	$ 6,286,410	$ 7,785,670
CART [CART-1] [CART-1]: TRANSIT -- CART Preventive Maintenance							
	Preventative Maintenance	2019	2040	$ 2,490,254	$ -	$ -	$ 2,490,254
CART [CART-2] [CART-2]: TRANSIT -- CART Operating Assistance							
	Operating Assistance	2019	2040	$ 19,749,766	$ -	$ -	$ 19,749,766
COAST [COAST-1] [COAST-1]: TRANSIT -- COAST Operating Assistance							
	Operating Assistance	2019	2040	$ 34,724,948	$ -	$ -	$ 34,724,948
COAST [COAST-2] [COAST-2]: TRANSIT -- COAST Preventive Maintenance							
	Preventive Maintenance	2019	2040	$ 15,590,784	$ -	$ -	$ 15,590,784
COAST [COAST-3] [COAST-3]: TRANSIT -- COAST Misc Support Equipment							
	Misc. Support Equipment	2019	2040	$ 2,381,139	$ -	$ -	$ 2,381,139
COAST [COAST-4] [COAST-4]: TRANSIT -- COAST Misc Bus Station Equipment							
	Misc. Bus Station Equipment	2020	2040	$ 1,207,339	$ -	$ -	$ 1,207,339
COAST [COAST-5] [COAST-5]: TRANSIT -- COAST General & Comprehensive Planning							
	General & Comprehensive Planning	2019	2040	$ 2,834,685	$ -	$ -	$ 2,834,685
COAST [COAST-6] [COAST-6]: TRANSIT -- COAST ADA Operations							
	Ada Operations	2019	2040	$ 6,909,560	$ -	$ -	$ 6,909,560

Town [State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
COAST [COAST-7] [COAST-7]: TRANSIT -- COAST Capital Program						
Capital Program	2019	2040	$ 4,266,701	$ -	$ -	$ 4,266,701
Danville [-] [6113001]: NH 111A -- Danville NH111A Sidewalks						
NH 111A sidewalks connecting municipal buildings and public areas plus a section of bicycle lane on both sides of the road (future TE)	2026	2028	$ 260,192	$ 268,518	$ 2,216,889	$ 2,745,599
East Kingston [-] [6135001]: NH 107 -- NH 107/Willow Road Sight Distance Improvements						
Improve Sight distance at intersection of NH 107 & Willow Road. Source: 2001-2003 TIP Proposal	2036	2038	$ 14,881	$ 15,357	$ 126,790	$ 157,028
EAST KINGSTON [26942] [-]: NH 107A -- NH 107A Bridge Rehabilitation						
Deck Replacement And Rehabilitation Over B&m Railroad & Road - 061/064 (red List Bridge)	2021	2021	$ -	$ -	$ 3,862,980	$ 3,862,980
Epping [-] [6147002]: NH 125 -- Signalize Lagoon Road Intersection with NH 125						
Signalize Lagoon Road Intersection with NH 125	2036	2038	$ 58,129	$ 59,989	$ 495,273	$ 613,391
Epping [-] [6147004]: NH 125 -- Signalize intersection of NH 125 & NH 87						
Signalize intersection of NH 125 & NH 87	2034	2036	$ 54,580	$ 56,327	$ 465,034	$ 575,941
Epping [-] [6147005]: NH 125 -- NH 125/North River Road Intersection Improvements						
Signalize the southern intersection of NH 125 with North River Road. Realign North River Road to eliminate skewed angle approaches to NH 125	2036	2038	$ 116,259	$ 119,979	$ 990,545	$ 1,226,783
Epping [-] [6147006]: NH 125 -- Signalize intersection of NH 125 with Lee Hill Road						
Signalize intersection of NH 125 with Lee Hill Road	2035	2037	$ 56,327	$ 58,129	$ 479,915	$ 594,371
Epping [-] [6147007]: NH 125 -- NH 125 Expansion - NH 87 to Lee Hill Road						
Widen NH 125 from NH 87 to Lee Hill Road	2035	2037	$ 719,012	$ 742,020	$ 6,126,119	$ 7,587,151
Epping [-] [6147008]: Blake Rd -- Bridge Replacement, Blake Road over Lamprey River [059/054]						
Bridge Replacement, Blake Road over Lamprey River [059/054]	2033	2035	$ 116,353	$ 120,077	$ 991,352	$ 1,227,782
Epping [-] [6147009]: Main St -- Lamprey River Bridge Repair/Replacement						
Repair/Replacement of Main Street bridge over Lamprey River [109/055]	2032	2034	$ 127,095	$ 131,162	$ 1,082,872	$ 1,341,129
Epping [13712] [6147001]: NH 125 -- NH 125 Expansion from NH 27 to NH 87.						
As described in the 2007 Corridor Study, the improvements would widen NH 125 for a length of 1.7 miles from Route 27 (Exeter Road) to NH 87. The final configuration would include two travel lanes in both directions with a center turn lane. Other improvements would include consolidation of access points, better driveway definition, and sidewalks along at least part of the section. The intersection of NH 125 with Old Hedding Road would be widened and signals upgraded. Where possible, signals will be coordinated with adjacent ones.	2020	2023	$ 1,135,456	$ 585,291	$ 9,512,538	$ 11,233,285

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
Exeter [-]	[6153001]: Epping Rd -- Epping Road Access Management						
	Implementation Of Access Management Plan Developed By Exeter To Likely Include Row Acquisitions And Driveway Consolidation.	2028	2030	$ 285,771	$ 294,915	$ 2,434,822	$ 3,015,508
Exeter [-]	[6153004]: NH 111 -- Exeter NH 111 Bike Shoulders						
	Shoulder bike route on NH 111 between Washington Street and Pickpocket Road [future TE]	2028	2030	$ 131,929	$ 136,151	$ 1,124,060	$ 1,392,140
Exeter [-]	[6153005]: NH 88 -- NH 88 Shoulders						
	Widen shoulders on NH 88.	2037	2039	$ 455,090	$ 469,653	$ 3,877,451	$ 4,802,194
Exeter [-]	[6153008]: Portsmouth Ave -- High St./Portsmouth Ave Intersection Improvements						
	High Street /Portsmouth Avenue Intersection Capacity Improvements. Source: 1999-2020 LRP	2035	2037	$ 889,156	$ 917,609	$ 7,575,783	$ 9,382,548
Exeter-Newfields [-]	[6001002]: NH 85 -- NH 87 shoulder widening -Exeter-Newfields						
	Widen shoulders on NH 85 from Main Street in Exeter to NH 87 in Newfields	2037	2039	$ 239,958	$ 247,636	$ 2,044,485	$ 2,532,079
FREMONT [23793]	[-]: MARTIN ROAD -- Martin Road Bridge Replacement						
	Bridge Replacement Over Piscassic River - 155/133 [sab*4216] {state Aid Bridge Program}	2020	2020	$ 118,437	$ 12,467	$ 517,380	$ 648,284
Hampstead [-]	[6195001]: NH 121 -- NH 121 Depot Road Intersection Capacity Expansion						
	Improve The Intersection Of NH 121/ Derry Rd/ Depot Rd In Hampstead	2029	2031	$ 46,627	$ 48,119	$ 397,271	$ 492,017
Hampton [-]	[6197001]: Ocean Blvd -- Ocean Blvd Reconstruction						
	Reconstruction of Ocean Boulevard from Haverhill Avenue in the south to Ashworth Avenue in the north to include a new road (back to the original level), new sidewalks and curbing along the west side of the roadway, new / enhanced crosswalks and new drainage system. Through a public / private partnership agreement Unitil has offered to work with the Town on the cost of new electrical poles and underground wiring.	2025	2028	$ 1,575,777	$ 1,626,202	$ 14,091,211	$ 17,293,190
Hampton [-]	[6197002]: US 1/NH 27 -- US 1/NH 27 Intersection Improvements						
	Improvements to the US 1 / NH 27 intersection. Realignment of Exeter Road (Route 27) to the south so as to align directly opposite High Street, which would improve the operation of the signalized intersection by allowing Exeter Road and High Street through movements to run under the same signal phase. This will also require construction of a new bridge over the railroad that is wider and aligned slightly to the the south of the current bridge.	2025	2027	$ 846,124	$ 873,200	$ 7,209,138	$ 8,928,461

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
Hampton [-] [6197004]: NH 27 -- NH 27 Bike Shoulders							
	Shoulder bicycle lanes on NH 27 from Exeter town line to US 1. Complete the Exeter-Hampton-North Hampton bicycle route loop, and work with NH DOT on developing and installing bike route markers.	2030	2032	$ 240,595	$ 248,294	$ 2,049,916	$ 2,538,805
Hampton [-] [6197006]: NH 27 -- Reconstuct of Exeter Road							
	Repaving / reconstructing urban compact streets. This project would rebuild all of Exeter Road (NH 27) within the urban compact area. Work would include reconstruction of the roadway, drainage, sidewalks, replacing traffic signals and improved street lighting.	2029	2032	$ 1,930,356	$ 1,992,127	$ 17,261,990	$ 21,184,473
Hampton [-] [6197009]: High Street -- Reconstruction of High Street							
	Repaving / reconstructing urban compact streets. This project would rebuild High Street (NH 27) within the urban compact area. Work would include reconstruction of the roadway, drainage, sidewalks, replacing traffic signals and improved street lighting.	2031	2034	$ 1,313,476	$ 1,355,507	$ 11,745,610	$ 14,414,593
Hampton [-] [6197010]: Winnacunnet Rd -- Reconstruction of Winnacunnet Road							
	Repaving / reconstructing urban compact streets. This project would rebuild all of the Winnacunnet Road within the urban compact area. Work would include reconstruction of the roadway, drainage, sidewalks, replacing traffic signals and improved street lighting.	2031	2034	$ 1,370,583	$ 1,414,442	$ 12,256,289	$ 15,041,315
Hampton [-] [6197011]: Church Stret -- Reconstruction of Church Street							
	Repaving / reconstructing urban compact streets. This project would rebuild all of Church Street within the urban compact area. Work would include reconstruction of the roadway, drainage, sidewalks, replacing traffic signals and improved street lighting.	2030	2032	$ 276,684	$ 285,538	$ 2,357,404	$ 2,919,626
Hampton Falls [-] [6199002]: US 1 -- US 1 Shoulders							
	Improve Route 1 from Seabrook Town line to Kensington Road (NH 84). Includes provision of full shoulder, access management improvements. From US 1 Corridor Study.	2028	2030	$ 180,725	$ 186,508	$ 1,539,808	$ 1,907,041
Hampton Falls [-] [6199003]: US 1 -- US 1 Shoulders & Access Management							
	Route 1 - Provide full shoulder and access management improvements from Lincoln Avenue to Hampton town line. From US 1 Corridor Study.	2032	2034	$ 204,992	$ 211,551	$ 1,746,568	$ 2,163,111
Kensington [-] [6239001]: NH 107 -- NH 150/NH107 Intersection Improvements							
	Realign and upgrade the intersection of NH 150 and NH 107 in Kensington. Possible location for a roundabout. Source: NH 107/150 Intersection Study	2035	2037	$ 168,980	$ 174,388	$ 1,439,746	$ 1,783,114

Town [State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
NEW CASTLE - RYE [16127] [-]: NH 1B -- NH 1B Moveable Bridge Replacement						
Rehabilitate Single Leaf Bascule Moveable Bridge Over Little Harbor - 066/071 {red List}	2019	2019	$ -	$ -	$ -	$ -
New Castle-Rye [16127] [6001007]: NH 1B -- NH 1B Bridge Rehabilitation New Caslte-Rye						
NH 1B - Rehabilitate single leaf bascule moveable bridge over Little Harbor - 066/071	2036	2039	$ 2,135,691	$ 2,204,033	$ 19,098,176	$ 23,437,900
NEWINGTON - DOVER [11238 S] [-]: SPAULDING TURNPIKE / LITTLE BAY BRIDGES -- Newington-Dover Spaulding Turnpike Improvements						
General Sullivan Bridge Rehabilitation	2019	2022	$ -	$ -	$ 31,700,000	$ 31,700,000
Newington [-] [6331001]: Pease Blvd/ NH Ave/ Arboretum Dr -- Pease Arboretum Drive Expansion						
The Arboretum Drive and Pease Boulevard Northbound approaches will need to expand from a single lane to a left turn lane and a shared through/right lane. The New Hampshire Avenue approach will need to be widened to accommodate a left turn lane, a through lane, and a right turn lane. The Southbound Pease Blvd approach can retain its existing geometry of a left turn lane and a shared through/right turn lane. A signal will be installed once expected warrants are met.	2025	2027	$ 150,727	$ 155,550	$ 1,284,219	$ 1,590,495
Newton [-] [6341001]: Pond Rd -- Replace Pond Road Bridge						
Pond Road Over B&M RR - Structurally Deficient 064/107	2033	2035	$ 364,926	$ 376,604	$ 3,109,240	$ 3,850,770
Newton [-] [6341002]: NH 108 -- Newton Rowe's Corner Improvements						
The project will replace the two-way stop controlled intersection of NH 108 with Amesbury Road and Maple Avenue with a roundabout. This will require some grade changes to the approaches. In addition, some work to the Pond Street intersection with NH 108 will be completed to create a perpendicular approach	2019	2021	$ 96,413	$ 1,171	$ 706,698	$ 804,282
North Hampton - Greenland [-] [6001008]: NH 151 -- NH 151 Shoulders						
Shoulder improvements (safety and bicycle improvement) on NH 151 from NH 111 to NH 33 .	2033	2035	$ 320,324	$ 330,574	$ 2,729,222	$ 3,380,120
North Hampton [-] [6345001]: US 1 -- US 1 Capacity Expansion Hampton Town Line to Atlantic Avenue						
Widen US 1 from Hampton town line to Atlantic Avenue (NH 111) to five lanes. Add fourth leg to Home Depot intersection and discontinue Fern road. From US 1 Corridor Study.	2028	2031	$ 1,437,514	$ 1,483,514	$ 12,854,805	$ 15,775,833
North Hampton [-] [6345002]: US 1 -- Cedar Road Bridge Replacement						
Replace Structurally deficient bridge over the B&M RR (148/132).	2031	2033	$ 285,538	$ 294,675	$ 2,432,841	$ 3,013,054
North Hampton [-] [6345003]: US 1 -- US 1 Shoulders Glendale Rd to Hobbs Rd						
Provide full shoulder to three lane section from Glendale Road to Hobbs road. From US 1 Corridor Study.	2037	2039	$ 119,979	$ 123,818	$ 1,022,243	$ 1,266,040

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
North Hampton [-] [6345004]: US 1 -- US 1 Intersection improvements (Hobbs Rd, Elm Road in N. Hampton)							
	Connect Hobbs Road with Elm Road and discontinue north end of Elm Road. Provide traffic signal connection from mid-point of Elm road to US 1. From US 1 Corridor Study.	2035	2037	$ 647,758	$ 668,487	$ 5,519,026	$ 6,835,271
North Hampton [-] [6345005]: US 1 -- US 1 Shoulders Elm Rd to North Road							
	Provide full shoulder for 3 lane section from Elm Road to south of North Road. From US 1 Corridor Study.	2037	2039	$ 95,983	$ 99,055	$ 817,794	$ 1,012,832
North Hampton [-] [6345006]: US 1 -- US 1/North Road (west approach) improvments							
	Realign the southern intersection of US 1 and North Road to the south, widen to 5 lanes at the intersection and install a traffic signal. From US 1 Corridor Study.	2034	2036	$ 481,216	$ 496,615	$ 4,100,051	$ 5,077,882
North Hampton [-] [6345008]: US 1 -- US 1 Shoulders North Rd to Lafayette Terrace							
	Provide full shoulders for three lane section of US 1 between North Road and new traffic signal in the vicinity of Lafayette Terrace. From US 1 Corridor Study.	2037	2039	$ 119,979	$ 123,818	$ 1,022,243	$ 1,266,040
North Hampton [-] [6345009]: US 1 -- US 1 Shoulders from North RD to Rye t/l							
	Improve shoulders from the New North Road access point to the Rye town line. New signal and widen to five lanes in the vicinity of Lafayette Terrace connecting residential and commercial properties on each side of US 1. From US 1 Corridor Study.	2034	2036	$ 481,216	$ 496,615	$ 4,100,051	$ 5,077,882
NORTH HAMPTON [24457] [-]: US 1 -- US 1 Bridge over B&M RR Replacement							
	Replace Bridge Over Boston & Maine Railroad - 148/132 {red List Bridge}	2021	2021	$ -	$ -	$ 3,740,100	$ 3,740,100
PLAISTOW - KINGSTON [10044 E] [-]: NH 125 -- Plaistow-Kingston NH 125 Improvements							
	Reconstruct From 1/4 Mi South Of Plaistow / Kingston T/l Northerly Approx 1.8 Mi Including Extension Of Kingston Rd. (pe & Row Funding Included Under Plaistow-kingston 10044b) (parent=kingston 10044b)	2021	2025	$ -	$ -	$ 18,923,500	$ 18,923,500
Plaistow [-] [6375004]: NH 121A -- NH 121A/North Ave. Intersection improvements							
	Intersection improvements at North Avenue And NH 121A In Plaistow	2037	2039	$ 361,266	$ 372,827	$ 3,078,058	$ 3,812,151
Plaistow-Kingston [10044E] [6001010]: NH 125 -- NH 125 Old County Rd to Hunt Rd/Newton Junction Rd.							
	Reconstruct NH 125 from northern limit of Old County Road project (10044D) to southern limit of Hunt Rd/Newton Junction Rd project (10044C), including extension of Kingston Rd	2026	2029	$ 2,057,146	$ 2,122,974	$ 18,395,794	$ 22,575,914
Portsmouth [-] [6379001]: Durham St/Corporate Drive/NH Ave/International Dr -- NH Ave/Corporate Drive intersection signalization							
	Installation of a traffic signal and construction of left turn lanes on the approaches to New Hampshire Avenue, Corporate Drive and International Drive.	2030	2032	$ 176,436	$ 182,082	$ 1,503,272	$ 1,861,791

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
Portsmouth [-]	[6379002]: Grafton Drive -- Grafton Drive Capacity Expansion						
	Grafton Drive will be widened to provide a five lane cross section, two through turn lanes in each direction and a center left turn lane. In addition left-through and right-turn lanes will be provided on the Portsmouth Transportation Center approach. Finally, a signal will be added to the intersection.	2028	2030	$ 225,906	$ 233,135	$ 1,924,761	$ 2,383,801
Portsmouth [-]	[6379003]: Corporate Dr/ Grafton Drive -- Corporate Dr/Grafton Drive intersection signalization						
	Installation of a fully actuated traffic control signal at the intersection of Corporate Drive and Grafton Drive on the Pease International Tradeport in Portsmouth.	2029	2031	$ 217,592	$ 224,555	$ 1,853,929	$ 2,296,077
Portsmouth [-]	[6379005]: Maplewood Ave -- Replace Maplewood Ave Culvert over North Mill Pond						
	Replace Maplewood Avenue culvert over North Mill Pond. Replacement structure will consist of three concrete arches with existing stone reused to construct seawalls.	2029	2031	$ 178,737	$ 184,456	$ 1,522,871	$ 1,886,063
Portsmouth [-]	[6379006]: US Route 1 Bypass -- Reconstruct US 1 Bypass from Lafayette Rd to Traffic Circle						
	reconstruct the US 1 Bypass to current standards between the split from Lafayette Road to just south of the traffic circle.	2032	2035	$ 1,685,544	$ 1,739,481	$ 15,072,784	$ 18,497,809
Portsmouth [-]	[6379007]: Maplewood Ave -- Maplewood Ave RR Crossing upgraded						
	Upgrade the railroad crossing on Maplewood Ave between Vaughan and Deer Streets.	2034	2036	$ 125,535	$ 129,552	$ 1,069,579	$ 1,324,665
Portsmouth [-]	[6379010]: I-95 -- Pannaway Manner Noise Barrier						
	Construct a noise barrier consisting of vertical wood sound walls along an approximately 2,000 foot portion of southbound I-95 where it passes Pannaway Manor.	2035	2037	$ 227,185	$ 234,455	$ 1,935,658	$ 2,397,298
Portsmouth [-]	[6379011]: US Route 1 -- US 1 Capacity Expansion from Ocean Rd to White Cedar Blvd.						
	Widen US Route 1 from Ocean Road to White Cedar Blvd to five lanes. Realign Lang Road to form 4-way intersection with US 1 at Ocean Rd via Longmeadow Rd.	2028	2030	$ 865,972	$ 893,683	$ 7,378,249	$ 9,137,904
Portsmouth [-]	[6379012]: Coakley Rd -- Coakley Road Bridge Replacement						
	Upgrade / replace aging bridge.	2034	2036	$ 36,023	$ 37,176	$ 306,923	$ 380,121
Portsmouth [-]	[6379013]: Bartlett St -- Bartlett St. Bridge Replacement						
	Bridge upgrade / replacement over Hodgson Brook	2033	2035	$ 60,292	$ 62,221	$ 513,701	$ 636,214
Portsmouth [-]	[6379015]: Cate Street -- Cate Street Bridge Replacement						
	Replace bridge	2033	2035	$ 84,621	$ 87,328	$ 720,983	$ 892,932

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
Portsmouth [-] [6379016]: Market Street -- Market St. RR Crossing upgrade							
	Upgrade the railroad crossing on Market Street near the intersection with Russell St. This hazard elimination project, includes upgrades of the rail, the roadway approaches, drainage improvements, and installation of protective devices at the crossing.	2032	2034	$ 150,874	$ 155,702	$ 1,285,474	$ 1,592,050
Portsmouth [-] [6379017]: US Route 1 -- US 1 Capacity Expansion from Constitution Ave to Wilson Rd.							
	Constitution Drive to Wilson Road. Some preliminary engineering has been completed. Project would reconstruct US Route 1 to upgrade corridor to provide better access management and capacity on roadway segments and at intersections.	2027	2030	$ 1,430,153	$ 1,475,918	$ 12,788,981	$ 15,695,052
Portsmouth [-] [6379018]: Pierce Island Rd -- Pierce Island bridge Replacement							
	Replace Pierce Island Bridge over Little Harbor	2030	2032	$ 461,141	$ 475,897	$ 3,929,006	$ 4,866,044
Portsmouth [-] [6379020]: US Route 1 Bypass -- Reconstruct US 1 Bypass from Traffic Circle to Sarah Long Bridge							
	Reconstruct the Northern segment of the US 1 Bypass between the traffic circle and the Sarah Long Bridge to current standards	2038	2040	$ 1,566,300	$ 1,616,421	$ 14,006,458	$ 17,189,178
Portsmouth [-] [6379021]: US Route 1 Bypass -- US 1 Bypass Traffic Circle Improvements							
	Functional and operational Improvements to the US 1 Bypass traffic circle. Assumes at grade circle/roundabout or intersection	2034	2036	$ 915,356	$ 944,648	$ 7,799,011	$ 9,659,015
PORTSMOUTH [13455 D] [-]: US 1 BYPASS -- US 1 Bypass Bridge Replacements							
	Replace Bridges (205/116) Woodbury Avenue And (211/114) Stark Street Over Us 1 Bypass {both Red List} (pe & Row In Parent 13455)	2020	2020	$ -	$ -	$ 8,371,440	$ 8,371,440
PORTSMOUTH [RPC30] [-]: US 1 -- US 1 Capacity improvements							
	Capacity Improvements From Constitution To Wilson And Ocean To White Cedar	2020	2023	$ 1,170,600	$ 1,812,000	$ 5,596,710	$ 8,579,310
PORTSMOUTH, NH - KITTERY, ME [16189] [-]: I-95 -- I-95 Piscataqau River Bridge Rehabilitation							
	Rehabilitation Of Bridge Over Piscataqua River - 258/128	2019	2019	$ -	$ -	$ 1,800,000	$ 1,800,000
PORTSMOUTH, NH - KITTERY, ME [29694] []: US 1 BYPASS -- Sarah Long Bridge Replacement - Debt Service							
	Debt service project for NH share of Sarah Long Bridge Construction (15731)	2019	2024	$ -	$ -	$ 64,890,354	$ 64,890,354
Region [-] [6001012]: Multiple -- Improvements to ITS/IMS Communications backbone							
	Region-to-TMC Communications Backbone: Implement a robust communications backbone between the State's TMC in Concord and the seacoast region. From Regional ITS Architecture	2033	2035	$ 608,210	$ 627,673	$ 5,182,067	$ 6,417,950
Region [-] [6001013]: Multiple -- Portable VMS for Region							
	Regional Portable VMS: Procure two portable VMS for the region to use to assist in construction traffic mitigation.	2030	2032	$ 13,473	$ 13,904	$ 114,795	$ 142,173

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
Region [-]	[6001014]: NH 125 -- Coss-border ITS Improvements						
	Route 125 and Interstate 495 Interchange Cross-Border ITS: Deployment of Advanced Traveller Information Services and Communications upgrades to coordinate traffic flow information across the MA-NH border.	2025	2027	$ 82,214	$ 84,845	$ 700,483	$ 867,543
Region [-]	[6001015]: Multiple -- Bridge Security Video ITS Improvements						
	Bridge Security Surveillance and Interagency Video Exchange: Establish a video distribution system to allow authorized municipal and transit organizations to view bridge conditions in real-time.	2028	2030	$ 277,111	$ 285,979	$ 2,361,040	$ 2,924,129
Rye [-]	[6397001]: US 1 -- US 1 Shoulders Breakfast Hill to Portsmouth City Line						
	Improve shoulders on US 1 from Breakfast Hill Road to Portsmouth city line	2034	2036	$ 218,321	$ 225,307	$ 1,860,137	$ 2,303,765
Rye [-]	[6397002]: US 1 -- US 1 Washington Rd. Intersection capacity imrprovements						
	Widen to five lanes and improve the Washington Road/Breakfast Hill Road intersection with US 1. Reduce vertical rise to the south to improve sight distance.	2025	2027	$ 330,913	$ 341,502	$ 2,819,444	$ 3,491,860
Rye [-]	[6397003]: US 1 -- US 1 Shoulders from N. Hampton T/L to Breakfast Hill Rd.						
	Improve Shoulders on US 1 from North Hampton Town line to Breakfast Hill Road. Realign Dow Road to 90 degree approach.	2033	2035	$ 126,931	$ 130,993	$ 1,081,475	$ 1,339,398
Salem [-]	[6399007]: Town Farm Rd -- Town Farm Rd. Bridge replacement						
	Bridge Replacement on Town Farm Road over Spicket River [118/116]	2035	2037	$ 227,147	$ 234,416	$ 1,935,338	$ 2,396,902
SALEM [12334]	[-]: NH 28 -- Salem Depot intersection reconstruction						
	Reconstruct Intersection, Main Street @ Depot Street, Including Signals, Left Turn Lanes & Approaches [mupca*450] {municipal Urban Program}	2019	2019	$ -	$ -	$ 2,835,690	$ 2,835,690
SALEM [15988]	[-]: TOWN FARM ROAD -- Salem Town Farm Road Bridge replacement						
	Bridge Replacement Over Spicket River - 118/116 [sab*4216] {state Aid Bridge Program}	2019	2019	$ -	$ -	$ 1,024,392	$ 1,024,392
SALEM [15989]	[-]: SOUTH POLICY STREET -- Salem South Policy Street Bridge replacement						
	Bridge Replacement - 083/062 [sab*4216] {state Aid Bridge Program}	2019	2019	$ -	$ 5,853	$ 734,890	$ 740,743
SALEM [20228]	[-]: BLUFF STREET EXT -- Salem Bluff Street Extension Bridge replacement						
	Bridge Replacement Over Widow Harris Brook - 116/116 {red List} (sab*4216)	2020	2020	$ -	$ 1,812	$ 789,066	$ 790,878
SALEM [26486]	[-]: SHANNON RD -- Salem Shannon Road Bridge replacement						
	Bridge Replacement Over Providence Hill Brook - 122/160	2020	2020	$ 142,480	$ 6,234	$ 760,487	$ 909,201

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
SALEM TO MANCHESTER [14800 A] [-]: I-93 -- I-93 Exit 1 area work							
	Mainline, Exit 1 To Sta. 1130 & Nh38 (salem), Includes Bridges 073/063 & 077/063 {both Red List} [partial Garvee Bonded Project] (parent = Salem To Manchester 13933*) [14800a=debt Service & 13933d=const]	2019	2024	$ -	$ -	$ 31,317,306	$ 31,317,306
SALEM TO MANCHESTER [14800 E] [-]: I-93 -- I-93 GARVEE Bond tracking project							
	Project Initiated To Track Garvee Bond Debt Service Attributable To The 13933e Project.[partial Garvee Bonded Project] (parent = Salem To Manchester 13933*)	2019	2020	$ -	$ -	$ 10,194,727	$ 10,194,727
SALEM TO MANCHESTER [14800 H] [-]: I-93 -- I-93 Final Design and ROW							
	Final Design Services For Pe And Row (garvee 2012 Bond Issue) [debt Service Project For Final Design Project 10418v]	2019	2020	$ 1,847,889	$ 348,507	$ -	$ 2,196,396
Salem-Windham [-] [6001017]: NH 28 -- Phase 3 of Salem-Concord bikeway							
	Phase 3 Of Salem-concord Bikeway: Main Street In Salem To NH 111 In Windham. 1.8 Miles.	2026	2028	$ 81,452	$ 84,058	$ 693,983	$ 859,492
Sandown [-] [6405001]: Phillips Rd -- Phillips Rd bridge replacement							
	Bridge Replacement on Phillips Road over Exeter River [093/109]	2032	2034	$ 81,997	$ 84,621	$ 698,627	$ 865,244
Sandown [-] [6405002]: Fremont Rd -- Bridge rehabilitation/replacement on Fremont Rd.							
	Bridge rehab/replacement on Fremont Road over Exeter River - 098/117	2032	2034	$ 71,747	$ 74,043	$ 611,299	$ 757,089
Seabrook [-] [6409001]: US 1 -- US 1 Capacity iprovements at the Seabrook Rotary							
	Reconfigure rotary on US 1 at the MA state line to a four way intersection as per the US 1 Corridor Study. Widen US 1 to 5 lanes	2027	2029	$ 419,560	$ 432,986	$ 3,574,733	$ 4,427,279
Seabrook [-] [6409002]: US 1 -- US 1 Capacity Improvements between Walton Rd and Gretchen Rd							
	Widen US 1 to 5 lanes between Walton Road and Gretchen Road From US 1 Corridor Study.	2030	2032	$ 442,695	$ 456,861	$ 3,771,846	$ 4,671,402
Seabrook [-] [6409005]: US 1 -- US 1 Capacity Improvements between the North Acess Rd and the Hampton Falls Town Line							
	US 1 - Transition from 5 lanes at the North Access Road to a 3 lane cross-section at the Hampton Falls town line. From US 1 Corridor Study.	2026	2028	$ 67,876	$ 70,048	$ 578,319	$ 716,243
Seabrook [-] [6409006]: NH 1A -- NH 1A Sidewalk in Seabrook							
	Curbed sidewalk linking Seabrook Beach community with Hampton Beach [future TE].	2025	2027	$ 44,396	$ 45,816	$ 378,261	$ 468,473
Seabrook-Hampton [-] [6001018]: NH 1A -- Route 1A Evacuation ITS Improvements							
	Route 1A Evacuation ITS Improvements: Deployment of Route 1A contra-flow signage, VMS, surveillance, and communications upgrades. From Regional ITS Architecture	2025	2027	$ 293,095	$ 302,474	$ 2,497,222	$ 3,092,790

Town	[State#][RPC#]: Route/Road -- Project Name & Scope	Start Yea	Finish Yea	Engineering	Right-of-Way	Construction	Cost Total
South Hampton [-] [6417001]: Whitehall Rd -- Whitehall Rd Bridge Replacement							
	Bridge Replacement on Whitehall Road over Powwow River [099/062]	2032	2034	$ 52,273	$ 53,946	$ 445,375	$ 551,593
South Hampton [-] [6417002]: Hilldale Ave -- Hilldale Ave bridge replacement							
	Bridge Replacement on Hilldale Avenue over Powwow River [069/066]	2032	2034	$ 122,995	$ 126,931	$ 1,047,941	$ 1,297,867
Stratham [-] [6431002]: Squamscott Rd -- Bike lanes on Squamscott Rd							
	Shoulder Bike Lanes On Squamscott Road From NH 108 To NH 33	2029	2031	$ 186,508	$ 192,476	$ 1,589,082	$ 1,968,066
Stratham [-] [6431003]: NH 108 -- Signalize NH 108/Bunker Hill Avenue intersection							
	NH 108 / Bunker Hill Avenue: Signalization And Turn Lanes And Intersection Realignment. Source: 1999-2020 LRP	2031	2033	$ 93,557	$ 96,551	$ 797,125	$ 987,234
Stratham [-] [6431004]: NH 108 -- Signalize NH 108/Frying Pan Lane intersection							
	NH 108/ Frying Pan Lane/ River Rd Signalization And Realignment And Lane Improvements. Source: 2001-2003 TIP Proposal	2034	2036	$ 158,938	$ 164,024	$ 1,354,180	$ 1,677,141
Grand Total				**$ 131,008,026**	**$ 39,477,430**	**$ 507,933,688**	**$ 678,419,144**

Current Unranked Projects

Location	Roads	Project Proposal and Scope of Work	Reason for not Ranking
Newfields	New Rd	Replace/Rehab structurally deficient bridge on New Road over BMRR 130/083. Source: NHDOT 2007 Red List Bridge Summary	Awaiting municipal action on bridge. No estimate.
Exeter	Main St	Pedestrian improvements linking Amtrak station and downtown.	No Scope/Purpose & Need, estimate
Exeter	Washinton St	Traffic calming - install speed tables and other devices.	No Scope/Purpose & Need, estimate
Exeter-East Kingston	NH 108	Shoulder bike route on NH 108 from Exeter town center to Newton town line.	No Scope/Purpose & Need, estimate
Fremont	Scribner Rd	Scribner Road over Exeter River - Structurally deficient bridge 106/076. Source: NHDOT 2002 Red List Bridge Summary	No Scope or Cost Estimate
Greenland	NH 33	Truck Stop Electrification Project [Formerly 06-08CM]	Truck Stop cannot expand for this type of improvement.
Greenland	NH 33	Address Capacity Issues on NH 33 between Bayside Road and NH 151	Needs corridor study/plan
Hampstead - Plaistow	NH 121A	Capacity Improvements And Shoulders To NH 121A Between NH 111 And NH 125	No Scope/Purpose & Need, estimate
Hampstead - Sandown	NH 121A	Capacity Improvements And Shoulders For NH 121A Between NH 111 And Sandown/chester Town Line	No Scope/Purpose & Need, estimate
Hampton	New	Construct a new limited access road connecting from NH 101 north to NH 151 following the B & M railroad alignment. Road will become a new US 1 alignment in that area and carry regional through traffic. The Route 1 Corridor Study states that access to the old Route 1 and the downtown area would be provided at signalized intersections at each end of the new roadway at one to two additional locations along the roadway, however, fewer connections will improve traffic flow and ensure that the roadway is primarily utilized by through traffic only.	Needs feasibility study and understanding of interest/need from community as well as configuration
Hampton	NH 101/ US 1	NH 101 interchange reconfiguration and construction of intermodal facility.	Awaiting completion of feasibility study
Newton	NH 108	Shoulder Bike Lanes On NH 108	No Scope/Purpose & Need, estimate
Plaistow	NH 121A	Main Street Traffic Calming/safety Improvements	Need more defined scope and cost
Plaistow	NH 125	Extension of MBTA Commuter Rail Service to Plaistow, including station construction, full high platform, and siding construction including land acquisition. Builds on CMAQ project 13515 funded in 2000 to construct a rail platform and subsidize operations for 3 years.	Awaiting Outcome of feasibility and siting study
Plaistow-Atkinson-Hampstead	NH 121	Safety Improvements Including Shoulders - State Line To Hampstead Town Line	No Scope/Purpose & Need, estimate
Portsmouth	New	Create new road along North Mill Pond between Bartlett St and Maplewood Ave	Needs feasibility study and updated scope/cost estimate
Seabrook-H. Falls-Hampton	East Coast Greenway	Construct multiple use pathway on State owned portion of B&M railroad from Seabrook Station to Hampton Town center near Post Office. East Coast Greenway.	Cost Estimate available but awaiting action from towns

Map 4 – Transportation Projects

2. Plan Impacts and Mitigation

Beginning with the enactment of SAFETEA-LU, 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.

2.1 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.

Table 3.7 below 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*. In addition, 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. We have utilized these data sources here as a primary source of identifying potential opportunities for mitigation activities that involve habitat protection and resource conservation, such as called for under water quality, wetlands, floodplains, farmland soils and habitat protection as identified in ***Table 3.7***.

Table 3.7: Common Resource Impacts and Associated Mitigation Activities for Transportation Projects

RESOURCE	IMPACT	TYPE	DURATION	POTENTIAL MITIGATION
Air Quality	• Emissions from construction activity and vehicles; • Long term impacts from localized and region from increase 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)	• Restrictions on noisy construction at night, & 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 (constructed) 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 increase 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 compromised floodplain in same sub-watershed; • Permanently protect replacement floodplain in same sub-watershed • Improved local planning and zoning
Archeological & Cultural Resources	• Loss of historically or culturally significant structures or features	Direct	Long term	• Avoidance or minimization through project design; • Relocation of structures;

Table 3.7: Common Resource Impacts and Associated Mitigation Activities for Transportation Projects

RESOURCE	IMPACT	TYPE	DURATION	POTENTIAL MITIGATION
				• Preservation through documentation (HABS/HAER)
Prime Farmland	• Direct loss of farmland through road construction • Indirect impact from secondary 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

Transportation project planners should consult these resources in the course of recommending mitigation approaches for transportation projects in the RPC/MPO area:

- The Natural Services Network **(Map 5)** 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 **(Map 5)** 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.

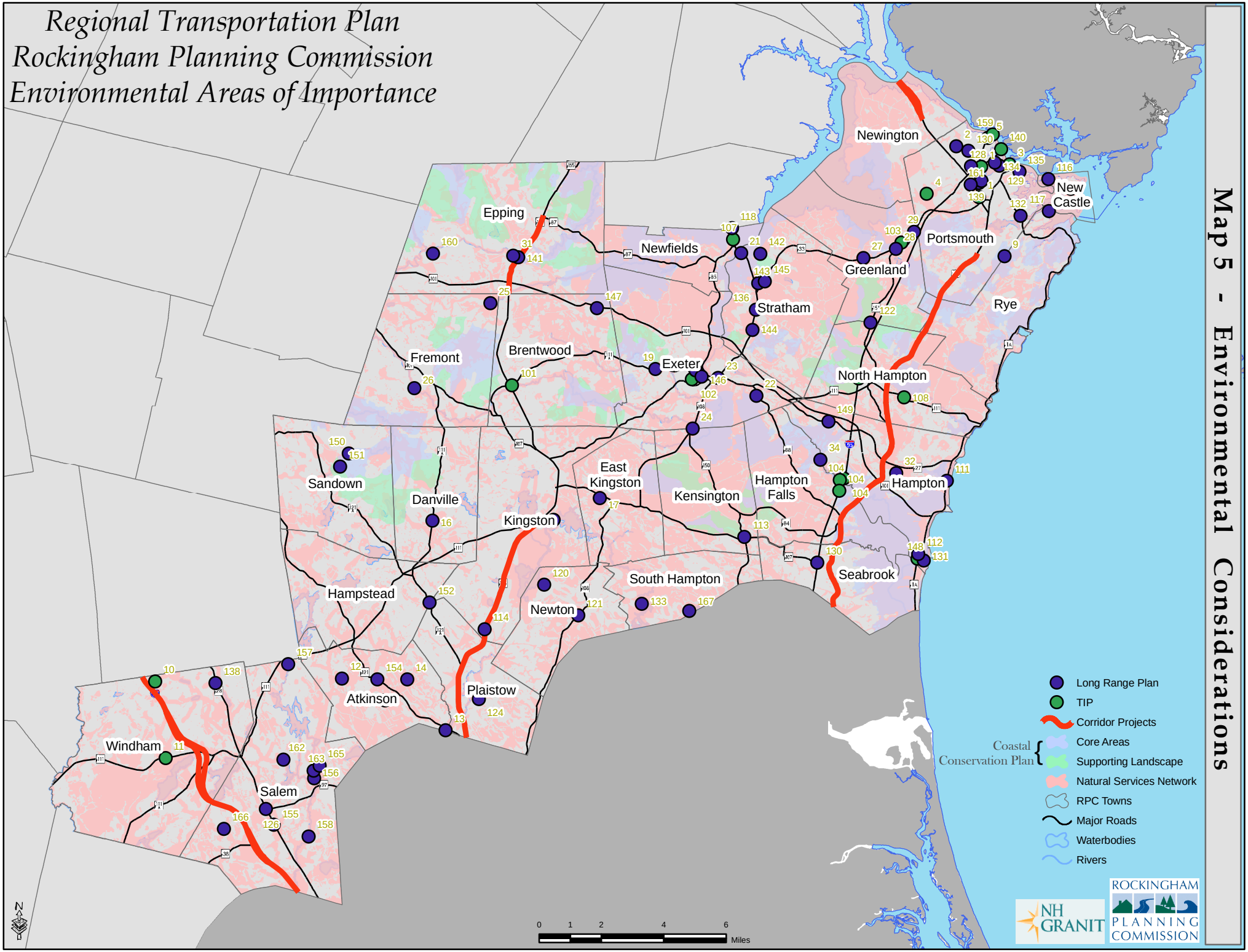
- The NH Wildlife Action Plan: includes the following resource information: NH Wildlife habitat land cover, highest-ranking wildlife habitat by ecological condition, conservation focus areas, and species distribution.

- 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.

In addition to the conventional mitigation strategies identified in Table 3.7, land use strategies have become increasingly important to mitigate the environmental impacts of transportation projects – especially impact related to induced and secondary growth. These strategies may include, but are not limited to, land use planning techniques such as districts or ordinances based on identified natural resources areas, such as 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, the NH Department of Environmental Services,

and the regional planning commissions of the state of New Hampshire. 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 unfragmented high value habitat areas that may be contiguous with 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.


Regional Transportation Plan
Rockingham Planning Commission
Environmental Areas of Importance
Map 5 - Environmental Considerations
Newington
Portsmouth
New Castle
Rye
Greenland
Newfields
Epping
Stratham
Brentwood
Exeter
Fremont
North Hampton
Hampton
Hampton Falls
Kensington
East Kingston
Kingston
Sandown
Danville
Hampstead
Atkinson
Plaistow
Newton
South Hampton
Seabrook
Windham
Salem
Long Range Plan
TIP
Corridor Projects
Coastal Conservation Plan
Core Areas
Supporting Landscape
Natural Services Network
RPC Towns
Major Roads
Waterbodies
Rivers
0 1 2 4 6
Miles
NH GRANIT
ROCKINGHAM PLANNING COMMISSION

2.2 Environmental Justice

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. Title VI states that "No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

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.

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. This Environmental Justice section of the Long Range Plan includes an analysis of minority and low income populations in the MPO region at both the municipal and Census block group level, and identifies the distribution of programmed projects in relation to those populations.

Low Income Households

For the 2000 Census, the poverty threshold was approximately $17,000 for a family of four. Table 3.8 identifies 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 5.0%. There are six communities where the percentage of households in poverty exceeds this regional threshold: Brentwood (5.1%), Exeter (5.3%), Hampton (5.6%), Newington (6.5%), Portsmouth (9.3%), and Seabrook (8.2%). Statewide, approximately 6.9% of the population falls below the federal poverty line, while nationally 11.8% of the population lives in poverty.

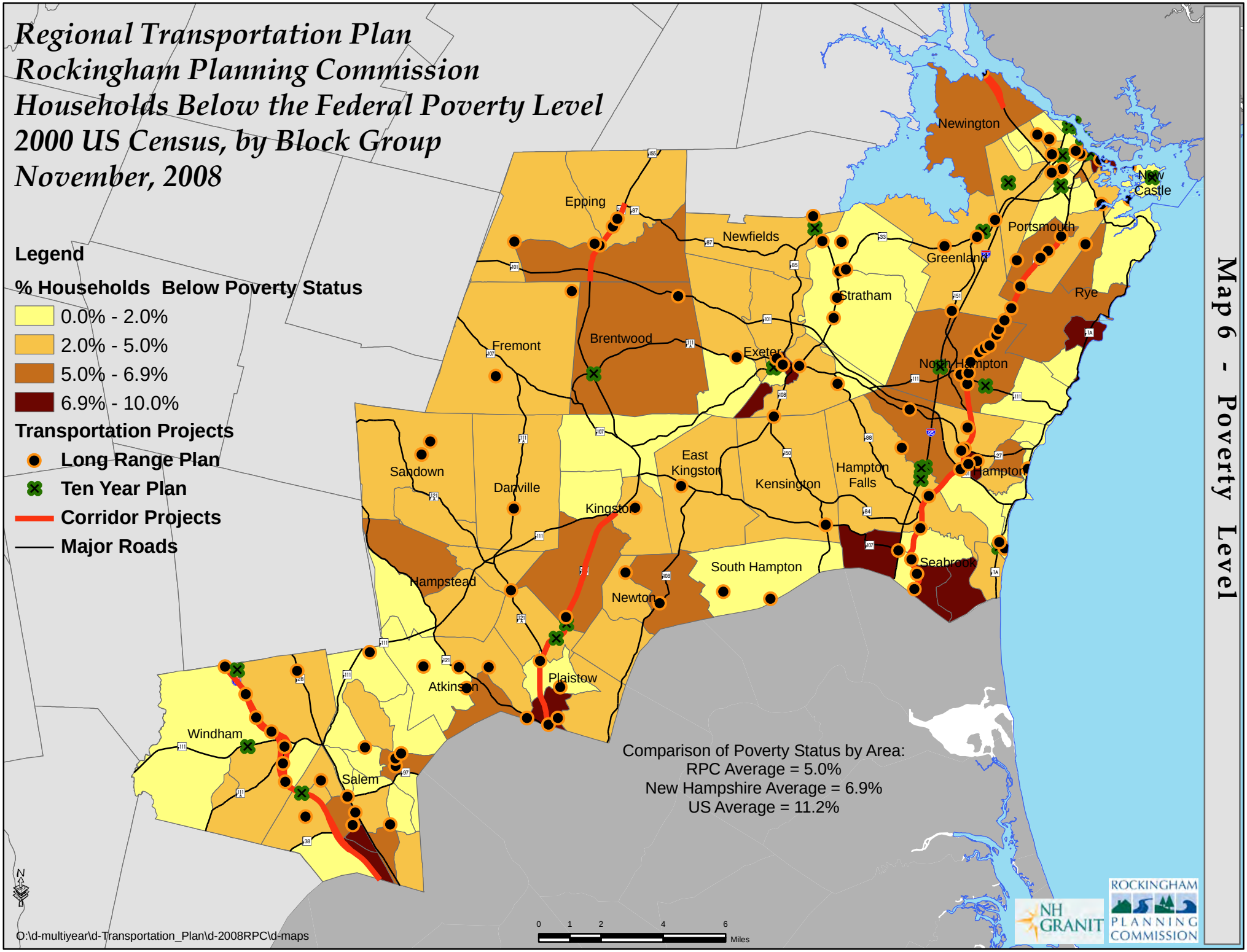
Table 3.8: Low Income Households in the RPC MPO Region by Town

Community	Number of Households	Households in Poverty	Percent of Households in Poverty
Atkinson	2,326	76	3.3%
Brentwood	906	46	5.1%
Danville	1,421	66	4.6%
East Kingston	625	19	3.0%
Epping	2,053	74	3.6%
Exeter	5,900	314	5.3%
Fremont	1,169	55	4.7%
Greenland	1,211	55	4.5%
Hampstead	3,045	105	3.4%
Hampton	6,474	363	5.6%
Hampton Falls	711	26	3.7%
Kensington	657	32	4.9%
Kingston	2,132	64	3.0%
New Castle	413	2	0.5%
Newfields	517	13	2.5%
Newington	293	19	6.5%
Newton	1,509	72	4.8%
North Hampton	1,660	77	4.6%
Plaistow	2,873	105	3.7%
Portsmouth	9,933	921	9.3%
Rye	2,174	85	3.9%
Salem	10,393	441	4.2%
Sandown	1,692	75	4.4%
Seabrook	3,413	280	8.2%
South Hampton	300	6	2.0%
Stratham	2,308	21	0.9%
Windham	3,579	63	1.8%
Totals	**69,687**	**3,475**	**5.0%**

Map 6 shows the percentage of households in poverty at the Census Block-Group level, with projects identified in the 2009-2012 Transportation Improvement Program and the 2009-2036 Long Range Transportation Plan, superimposed.

The highest concentrations of low-income households in the region are in Salem along NH Route 28, in Seabrook along US Route 1, in Exeter along NH Route 108, in Plaistow along NH Route 125, in Portsmouth along US Route 1, and in a small segment of Rye. These largely correspond to manufactured housing or larger multi-family housing developments, and in the case of Rye, winter rental of summer houses. The distribution of projects does not suggest that areas within the region with a higher percentage of low-income residents are subject to a disproportionate share of adverse impacts from highway projects, as construction impacts related to adjacent projects should be short term, with long term benefits in terms of safety and accessibility.

Regional Transportation Plan
Rockingham Planning Commission
Households Below the Federal Poverty Level
2000 US Census, by Block Group
November, 2008



Map 6 - Poverty Level

Minority Population

Table 3.9 identifies the number of racial and ethnic minority residents for each municipality in the Rockingham Planning Commission region, as well as minority residents as a percentage of overall population. Region-wide minorities make up approximately 3.5% of the population. This average is exceeded in three communities: Newington (5.4%), Portsmouth (6.1%), and Salem (6.1%). Statewide, members of racial and ethnic minority groups make up 5.6% of the population, while nationally minorities account for 37.6% of the population.

Table 3.9: Minority Populations in the RPC MPO Region by Town

Community	Total Population	African American	American Indian	Asian & Pacific Islander	Hispanic	Two or More	Total Minority Pop	Percent Minority Pop
Atkinson	6,178	0	0	58	74	19	151	2.4%
Brentwood	3,197	38	5	17	26	9	95	3.0%
Danville	4,023	40	33	10	21	0	107	2.7%
East Kingston	1,784	4	7	19	4	7	41	2.3%
Epping	5,476	13	21	13	22	5	74	1.4%
Exeter	14,058	56	5	163	140	33	397	2.8%
Fremont	3,510	0	4	10	0	4	18	0.5%
Greenland	3,205	0	0	65	28	8	101	3.2%
Hampstead	8,297	7	13	62	82	8	202	2.4%
Hampton	14,937	96	19	134	147	108	504	3.4%
Hampton Falls	1,880	0	0	17	15	2	34	1.8%
Kensington	1,887	4	0	15	0	0	19	1.0%
Kingston	5,862	58	0	22	58	9	147	2.5%
New Castle	1,009	0	0	0	0	0	0	0.0%
Newfields	1,551	0	2	3	9	2	16	1.0%
Newington	778	8	3	13	6	12	42	5.4%
Newton	4,289	45	0	7	54	26	132	3.1%
North Hampton	4,259	7	0	0	69	34	110	2.6%
Plaistow	7,747	0	0	94	66	0	160	2.1%
Portsmouth	20,785	448	29	442	271	74	1,278	6.1%
Rye	5,182	41	0	41	62	0	144	2.8%
Salem	28,112	80	59	789	535	258	1,721	6.1%
Sandown	5,143	0	10	0	36	0	46	0.9%
Seabrook	7,934	25	25	24	119	32	225	2.8%
South Hampton	850	9	0	0	4	0	13	1.5%
Stratham	6,355	0	6	32	46	8	92	1.4%
Windham	10,709	76	0	89	99	58	322	3.0%
Totals	**178,997**	**1,055**	**241**	**2,139**	**1,993**	**716**	**6,191**	**3.5%**

Map 7 shows the minority population as a percentage of total population at the Census Block-Group level, with projects identified in the 2009-2012 Transportation Improvement Program and the 2009-2036 Long Range Transportation Plan superimposed. The highest concentrations of minority populations in the region are in Salem along Route NH28, in Seabrook along Routes US1 and NH1A, in Exeter along Route NH108, and Portsmouth along Route US1. The distribution of projects does not suggest that

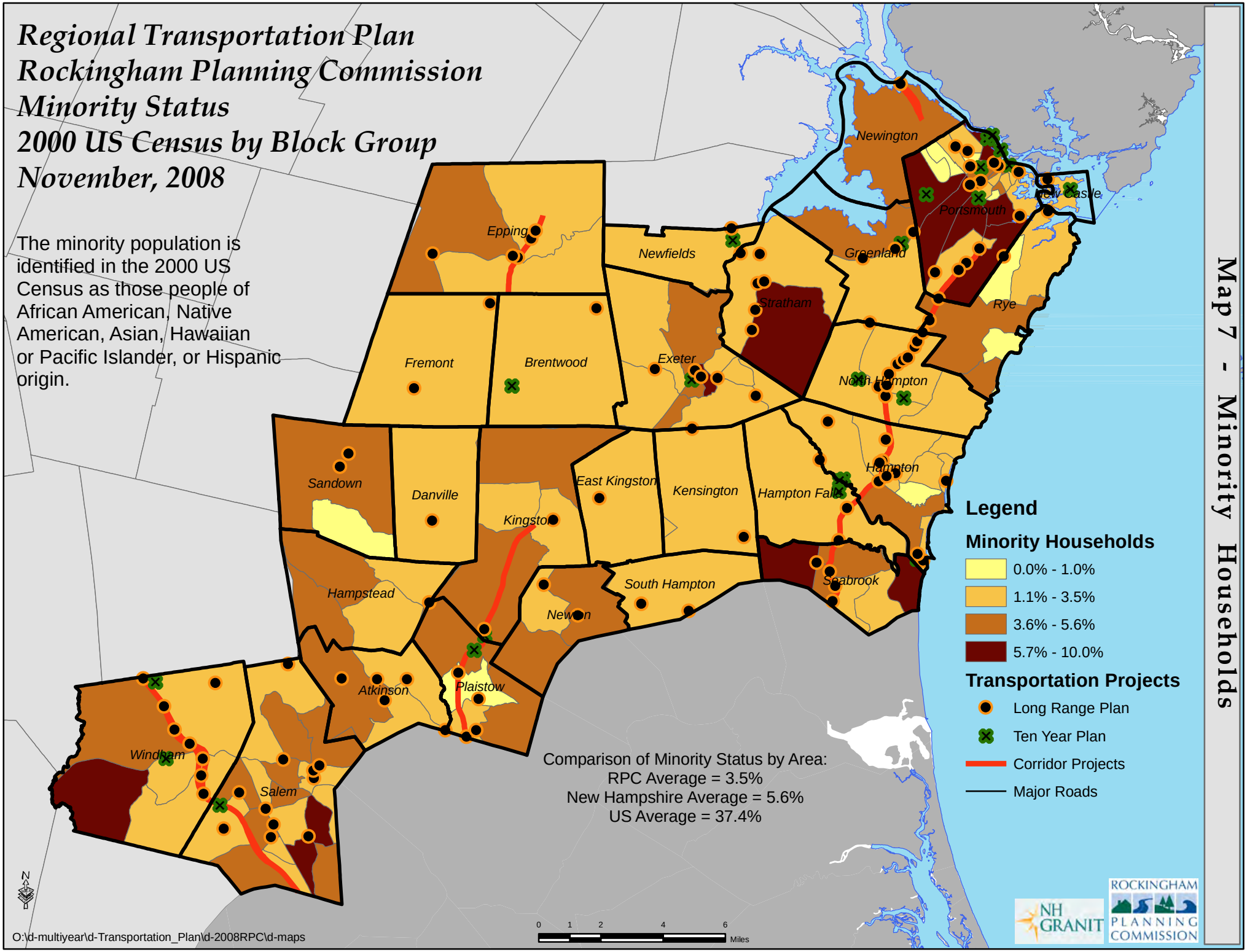
communities with larger minority populations are subject to a disproportionate share of either benefits or adverse impacts from transportation projects.

Region-wide the concentration of low-income and minority residents is low relative to populations at the state and national levels. Greater concentrations are largely found in the relatively urbanized areas of the region, such as Portsmouth, Salem, Newington, Seabrook and Exeter. Analysis of the distribution of projects programmed in the NH Ten Year Transportation Plan or identified in the MPO Long Range Transportation Plan does not suggest that these populations bear a disproportionate share of adverse impacts from transportation projects.

The aspect of transportation investment in New Hampshire where there is an equity disparity is investment in public transportation. Nationally approximately 25% of households below the federal poverty line do not have access to a private automobile. In the MPO region approximately 2,900 households lacked access to a private automobile according to the 2000 Census, or about 4.2% of the households in the region. While the State of New Hampshire pays the non-federal matching cost share for most projects on the state highway network, the State provides minimal support for public transportation. This has resulted in an unbalanced transportation system where basic mobility for citizens who drive is ensured statewide through the network of state highways; while citizens unable to drive (who are disproportionately low-income) may or may not have access to basic mobility, depending on municipal support for public transportation.

Regional Transportation Plan
Rockingham Planning Commission
Minority Status
2000 US Census by Block Group
November, 2008

The minority population is identified in the 2000 US Census as those people of African American, Native American, Asian, Hawaiian or Pacific Islander, or Hispanic origin.



Map 7 - Minority Households

2.3 Safety Impacts

There are a number of highway projects in the region that are at least partially designed to address safety issues. The Newington-Dover Turnpike Expansion project will initially address safety through some interim improvements to the roadway network as well as through an Incident Management System (IMS). This IMS is designed to reduce the number of accidents on the turnpike in that area, as well as to reduce the congestion and delay impacts of any accidents that occur through rapid and coordinated response from all necessary resources. The primary project will also address safety through improved interchanges, roadways, and removing local traffic from the facility where possible. The I-93 widening, shoulder improvements, and interchange improvements should show safety benefits for that corridor in terms of reduced numbers of accidents as well as an IMS to help better manage accident response.

There are a number of intersection projects listed that will have safety benefits. Particularly work on NH 125 and US 1 will lead to much safer facilities as dangerous intersections are reconfigured and in some cases signalized. In addition, both of these corridors will be implementing strong access management programs that will better control where and how many driveways access the roadway. These types of improvements have been shown to substantially reduce the number of accidents and promote better flow of traffic.

There are also several pedestrian and bicycle projects in the region designed to improve the safety of those roadway users. Shoulders on NH 108 in Newfields and Newmarket will make that roadway much safer for cyclists, and sidewalks in the vicinity of the North Hampton elementary school will provide a needed connection between the school and the town library and other facilities. A pathway is also being developed at Pease that will connect the airport and other areas to the Transportation Center providing an off-road facility for bikes and pedestrians.

The NH DOT has begun the implementation of the Highway Safety Improvement Program (HSIP) and this program will implement a number of safety related projects on a fast-track that will allow these critical projects to avoid the 10 Year Plan process.

2.4 Transportation System Security

While there are no projects listed in the TIP or Long Range Plan that are specifically for the purpose of addressing transportation system security concerns, a number of projects will increase capacity on major transportation facilities in the region such as the I-93 and the Spaulding Turnpike. In addition, there are a number of improvements planned for the region that will have additional benefits along these lines.

- Interstate 95 Exit 1 interchange capacity improvements in Seabrook. This interchange is part of the evacuation routes for the Seabrook Nuclear Power plant and is significantly over capacity during peak hour operations under existing conditions. The widening of this bridge to allow for two through lanes and the signalization of the southbound ramps will provide additional capacity and better traffic flow through the interchange.

- US 1 corridor improvements. US 1 is also part of the evacuation network for the nuclear power plant as well as a coastal evacuation route. Portions of this roadway have serious capacity and safety issues that if addressed, would provide benefits for security and disaster purposes as well.
- Highway Incident Management Systems. NH DOT has developed, or is in the process of developing, Incident Management Systems for the major highway corridors in the region including I-93, I-95, and the Spaulding Turnpike. Each of these includes disaster and security event scenarios to ensure that responders understand what the procedures are for each potential situation.
- Transit Security Plans. Because both COAST and CART utilize FTA Section 5307 funding, each agency is already required to develop Safety and Security plans. COAST adopted their plan in 2003. Because of its cooperative management agreement with the Merrimack Valley Regional Transit Authority (MVRTA), CART has operated under MVRTA's safety and security plan. However, CART will need to develop its own plan as part of the process of securing status as a Designated Recipient of FTA Section 5307 funds, which should be finalized in 2008.

2.5 Transportation System Management and Operations

Regional transportation systems management and operations (M&O) means an integrated program to optimize the performance of the existing infrastructure. This is accomplished though implementation of multi-modal, cross-jurisdictional systems, services, and projects that are designed to preserve capacity and improve security, safety, and reliability. These types of project can help to link planning and operations by helping the involved agencies to better understand the needs of the system as a whole and the processes involved. Direct MPO involvement in planning for systems management and operations ensures that projects are adequately supported in the long-range planning and programming process and considered when establishing funding and project priorities. Consideration of these types of projects in long range planning also involves and educates operations personnel about broader regional planning and policy objectives that cut across modes and jurisdictions.

The most visible implementation of regional systems management and operations in New Hampshire has been the E-Z Pass system of electronic toll collection which has increased the capacity of the toll facilities tremendously and has had system wide implications for travel. Other areas where regional management and operations projects can have impacts are in emergency preparedness and security, freight system operations, multi-jurisdictional arterial management, and implementation of Intelligent Transportation Systems (ITS) technologies.

There are a few projects within the Long Range Plan that address operations and management issues. Primarily this is a result of the focus on preservation of the existing system over large capacity increases.

- I-93 and I-95 Incident Management Systems
- Spaulding Turnpike Incident Management System
- DOT Signal Timing initiative
- Transit system improvements on I-93 and the Spaulding Turnpike.
- Access Management Programs on NH 125 and US 1.

The Regional ITS Architecture developed by the Rockingham Planning Commission and Strafford Regional Planning Commission includes a strategic plan that recommends specific initiatives for implementing the ITS Architecture and the goals of improving safety and operations. The main thrust of these improvements is to improve the operation of the region's arterials through better management of traffic and optimization of the system.

The projects that carry out these goals consist of the following projects in the RPC region:

- Salem Route 28 Corridor ITS Project
- Portsmouth Woodbury Avenue Signal Coordination
- US Route 1 Bypass Signal Coordination in Portsmouth
- Route 125 Signal Coordination in Plaistow and Epping
- I-93, I-95, and Spaulding Turnpike Incident Management Systems
- Regional Portable Variable Message Signs
- Regional coordination of human health services transportation
- Park and Ride ITS Improvements
- Regional transit ITS procurement coordination.

Chapter 4: Implementation Strategies

The implementation of the Long Range Transportation Plan is more than simply the construction of the projects contained within it. Many of the goals and policies identified in Chapter 2 are necessary additions to the local and regional planning process to ensure that the entire transportation system is developed and maintained. Four general categories have been established with recommendations and strategies in several sub-categories of each with the intent that the MPO and partners will utilize them in the transportation planning process. The categories are:

1. Improving the Transportation Planning Process
2. Addressing Regional Accessibility and Mobility Needs
3. Managing Congestion on the Roadway Network
4. Improving the Safety and Security of the Transportation System

1. Improving the Transportation Planning Process

There are four general strategies that involve making improvements to the transportation planning process in the region, each with specific recommendations for further work. The strategies relate to fulfilling regulatory requirements, tracking the performance of the transportation system and planning process, utilizing Context Sensitive Solutions (CSS) to address transportation issues, and exploring financing options for funding transportation projects.

1.1 Fulfilling Regulatory Requirements

The policies in Chapter 2 address a number of requirements related to SAFETEA-LU and subsequent planning regulations established by FHWA and FTA. Over the last couple of years, the MPO has expended considerable time and effort bringing itself into compliance with these requirements. ***Table 4.1*** on the following pages outlines the MPOs work on meeting these requirements.

Recommendations

Although the MPO is meeting the requirements of SAFETEA-LU, there is still work remaining to do. In this regard, the following recommendations are made:

1. Determine the role of the MPO in Security Planning for the transportation system and integrate that into the Long Range Transportation Plan.
2. Determine the role of the MPO in the Management and Operation of the regional transportation network and integrate that into the Long Range Transportation Plan.
3. Expand the use of visualization techniques in the planning process for the region

Table 4.1: SAFFETEA-LU Required MPO Activities

Planning and Programming Requirements	Yes/No	Comments
Is the MPO publishing its annual listing of obligated projects?	Yes	The annual publication of the listing began in Fall, 2007 and is published after the end of the Federal Fiscal year (September 30th). The most recent version of this document is listed here: http://www.rpc-nh.org/PDFs/2007_ALOOP.pdf. The 2008 version will be published near the end of December, 2008.
Are safety and security treated as stand-alone factors in the transportation planning process?	Yes	Safety and Security are listed as standalone planning factors in the MPO Prospectus and Long Range Plan. Safety and Security issues are discussed in most sections of the Plan.
Does the Transportation Plan include a discussion of environmental mitigation activities?	Yes	The Long Range Plan addresses environmental mitigation in several areas, including a specific section within *Chapter 3.*
Was the discussion of environmental mitigation activities developed with consultation from appropriate federal and state resource agencies?	Yes	The Plan incorporates interagency consultation in two ways: (1) It uses existing agency plans and related documents such as the NH Wildlife Action Plan and Coastal Conservation Plan to incorporate information about critical environmental resources in the region that may be impacted by transportation projects, and (2) a LRTP plan section which addresses environmental mitigation per se that was initially developed under the interim MPO Long Range Plan published in October, 2007 and made available for comment from resource agencies at that time. The 2009-2035 Plan was presented to those agencies at the NHDOT Natural Resources Agency Coordination Meeting on 8/20/08 and the agenda & minutes can be found here: http://www.nh.gov/dot/bureaus/environment/NaturalResourceAgencyCoordinationMeeting.htm.
Does the Transportation Plan include operations and management strategies?	Yes	The Plan contains limited operations and management (O&M) strategies, primarily focused on planning aspects of transit agency O&M, as well as local level transportation O&M. Chapter 4 includes specific strategies.
Do the MPO TIP and Transportation Plan provide system-level costs and revenues for operations and maintenance of existing transportation facilities?	Yes	Yes; the TIP and Plan include regional-scale estimates of O&M costs and revenues occurring at the local level, within transit agencies, and as provided by the NHDOT for its operations. See Chapter 3 of the Plan.
Are the MPO TIP and Transportation Plan fiscally constrained by year and revenue source?	Yes	The Plan contains extensive revenue and cost information and fiscal constraint analysis. The TIP is constrained by year and revenue source as determined by the NHDOT. The initial year of the Long Range Plan (through the end of the current Ten Year Plan) are constrained by source and year. Beyond the 10 Year Plan the Project contained in the Plan are constrained in total, but not but year of implementation. Too much uncertainty exists about actual project costs and the specific year of implementation to make such an analysis worthwhile. *See Chapter 3 which discusses projects and financing.*
Do the MPO TIP and Transportation Plan provide the most recent available cost estimates for transportation projects?	Yes	Cost estimates are up-to-date as provided by NHDOT, community or relevant transit agency. Generally, the NHDOT updates project estimates with each new edition of the STIP and/or 10 Year Plan.
Are the MPO TIP and Transportation Plan consistent in their project listings and cost estimates?	Yes	Yes the Plan and TIP are consistent in this respect. A subsection of *Chapter 3: Constrained Plan* entitled *Fiscally Constrained Project List includes (for the first four years) the projects listed in the MPO TIP (excluding statewide projects).*

Table 4.1: SAFFETEA-LU Required MPO Activities

Planning and Programming Requirements	Yes/No	Comments
Does the MPO TIP and Transportation Plan provide year-of-expenditure projects cost and revenue estimates?	Yes	The NHDOT has provided a recommended average annual project cost inflation rate which the MPO has used in estimating project costs for Plan years. Revenue estimates have been generated which account for expected revenue increases or decreases based on the best available information, or in the absence of same, on the straight-line continuation of current funding levels.
Is the list of projects considered in the regional emissions analysis for conformity consistent with the financially constrained list of projects in the TIP and Transportation Plan?	Yes	The projects included in the regional emissions analysis (a subcomponent of the analysis for the Southern NH Moderate 8-hour Non-attainment Area) are drawn directly from the TIP and Plan project list.
Has the Coordinated Public Transit-Human Services Transportation Plan for the MPO been completed?	Yes	Yes; separate Coordinated Public Transit-Human Services Plans have been completed covering the CART service area (prepared by the RPC MPO predecessor agency) and the COAST service area, prepared under contract for both the SRPC-MPO and RPC-MPO. The Plans are entitled "Coordinate Public Transit Human Services Transportation Plan for the Seacoast Region of New Hampshire" (2007) and Greater Derry Greater Salem Regional Transit Coordination Plan (2003). Both documents are located on the RPC website at http://www.rpc-nh.org/docs.htm
Are visualization techniques used in the development of TIP and Transportation Plan?	Yes	The TIP and Plan make liberal use of charts, graphs and maps to illustrate information contained in the narrative documents. Project-level 3-D visualization of project elements and alternatives is not included in the MPO planning level documents, but is now commonly included in MPO corridor studies and larger NHDOT project designs. [Examples: Route 1 Corridor Study; Newington-Dover Expansion Project; Portsmouth-Kittery Memorial Bridge Project)
Does the MPO have a documented public participation plan that defines the process for providing citizens and other affected and interested parties with reasonable opportunities to be involved in the transportation planning process?	Yes	Yes. Two separate Plans were developed and adopted for the Seacoast and Salem-Plaistow-Windham MPOs prior to MPO realignment. The RPC-MPO consolidated and re-adopted the Public Participation Plan as a component of its *Prospectus* in April 2008. *See Section 7 - Public Participation Process of the current Prospectus.*

1.2 Tracking the Performance of the Transportation System

Performance measures are specific criteria that are utilized to track the status of a particular aspect of the transportation system such as the number of accidents, volume-capacity ratio, and travel delays. Performance measures are used to:

- Illustrate what attributes of the transportation system are most important
- Provide information on current/baseline conditions
- Evaluate project implementation and on-going projects
- Provide a basis for communicating and comparing past, current, and future conditions
- Serve as criteria for investment decisions in the transportation planning process.

Specifically, the MPO can use performance measures to assess progress in implementing the goals and policies of the Plan, periodic reporting on the state of the regional transportation system, and to guide resource allocation and budgeting. The outcome is that the MPO has a better understanding of the day-to-day operation of the transportation system that improves policy-making, project programming, and project development processes. Performance measures can be objective or subjective in nature, reflecting data and facts, or perceptions and anecdotal evidence. They measure input by addressing the supply of resources (budget levels), output through the delivery of projects and programs (miles of new roads built), or outcomes which compare the system to established goals (changes in accident rates).

The development of performance measures is by nature an iterative and incremental process. The measures that have been selected are a starting point for the region and will likely change over time as the process is refined or better measures for the region are discovered. The intent is to start in areas where data is available and can be categorized and evaluated with existing resources. As we gain a better understanding of the measures available, the ease of data collection, and the analysis of the data, additional measures can be included that provide more depth or detail regarding the performance of the system. The following table and descriptions discuss measures that the RPC will be utilizing.

Accessibility

Mode split by area, facility, or route measures how travelers are arriving at their destinations. A high share of SOV travel likely means that making similar trips for older, disabled, or low-income people is difficult because they cannot drive or cannot afford a reliable automobile. This might also be combined with the percentage of person trips that could be accommodated by modes other than auto. Average trip length also measures how people travel, and if most trips are fairly long (especially commutes), then traveling may be prohibitive for those who need to walk, bike, pay for transit, or maintain a reliable car.

Roads

A performance measure such as accessibility time difference could help with land use planning. This measures the difference in time between the fastest and second fastest highway access points. A long time difference may affect development and land values. For freight accessibility, the number of bridges with restrictive vertical clearance is an important factor. In the RPC region there are a number of railroad trestles that cannot be passed under by tractor trailers as well as a number of bridges over the railroad that cannot accommodate double stack rail cars. The presence of sidewalks and crosswalks connecting residential, commercial and civic zones is also a measure of accessibility.

Transit

The percentage of the region's population within ¼ mile (or 15 minutes) of transit services measures how mobile the population is when they do not use their automobiles. More importantly, and as a matter of equity, it also measures the mobility of those who cannot afford cars. Increasing the percentage of the population living near transit would serve low-income households who cannot afford a car, or who are cost-burdened in maintaining one or more cars but lack other options. Improved access to transit also serves other segments of the population seeking alternatives to driving for economic, convenience or environmental reasons, supporting regional congestion management and air quality goals. Finally, transit access impacts access to basic life needs for the region's mobility impaired populations, affecting their access to medical care, government offices and civic activities, grocery stores and other shopping needs.

Environmental Impacts

How many tons of pollutants are generated by the transportation system? This measurement should include air pollution from cars, buses, and trains, water pollution from road salt and road construction. Congestion and idling both greatly increase the amount of air pollution created by automobiles. The corollary to this measurement is how many days each year is the region in air quality noncompliance? This is affected by factors in addition to transportation, but transportation is widely considered to have a great deal of impact.

Roads

Is there a change in energy consumption due to the use of more fuel efficient vehicles or a greater reliance on carpooling, telecommuting, or public transportation? Also, what are the direct impacts of roadway projects on the number of acres of wetland that are created/impacted/banked.

Transit

One benefit from expanding transit networks is the potential to reduce automobile emissions. Has development of new transit services led to improvements in water and air quality in the region, or at least mitigated what would be even higher levels of pollution? How do bus and train emissions compare with automobile emissions? How many automobiles does the use of buses and trains take of the road? What is the difference in tons of pollution created?

Equity

What percentage of a family's income is spent on transportation? Do low-income families spend an appropriate amount of their income on transportation or do they spend too much? Is the more profound issue the inability to live near employment centers or that automobile ownership is required for shopping, commuting, medical appointments, and any other trips? These questions lead directly into the need to measure the Auto-Dependence Index (ADI). The ADI "compares the Transportation Cost Indices for auto and non-auto modes to indicate the degree of auto-dependence that the land use and transportation system fosters… The ADI is a measure of dependence, not behavior. ..It is affected by changes in transport costs. For example, higher fuel prices and deteriorating highway levels-of-service would increase the automobile Transportation Cost Index (TCI), and, especially where the most attractive non-auto mode is not affected by fuel costs or congestion would lower the ADI."

Roads

Road equity requires that the PCI in low-income or minority areas is similar to that of more affluent neighborhoods. Roads, including sidewalks and bike paths, in low-income neighborhoods should be maintained at a similar level to those in wealthier neighborhoods.

Transit

Equity measurements for public transportation should determine if transit amenities and vehicle assignment (age, air conditioning, emissions) are similar for low-income and mid- or high- income neighborhoods. Public transportation is likely more important in low-income areas and should not be at a Level of Service (LOS) below high-income areas. For transit options to be useful for low-income residents they must be affordable. What percentage of the region's unemployed or low-income residents cites transportation access as a significant barrier to seeking employment? A public transportation network that helps the unemployed go to work has the potential to serve many purposes: as a matter of equity it helps the disadvantaged, while as a budgetary matter, improving access to jobs should lead to fewer welfare and unemployment claims. Finally, improved transit access to employment centers supports businesses' employee recruitment and retention needs.

Land Use

There are a number of measures that can be examined from a land use perspective to provide insight as to the performance of the transportation system. In terms of the amount of land consumed from development, does land use increase at the same or slower rate than the population rate? How much land is being preserved? Particularly important are agricultural and other natural resource areas. Areas that slow their land use are less likely to suffer from sprawl pattern development and the transportation problems that accompany it. Is mixed use development allowed or encouraged? These types of regulations should increase bicycling and walking and reduce congestion. Are communities coordinating their land use, zoning, and public transportation? Are towns working at cross purposes (both internally and with neighbors) or do they collaborate? Is development having an impact on the Level of Service (LOS) on the roadways?

Mobility

The public's assumptions about and perception of travel times has a very real impact on their transportation choices as well how they vote. Commuters may not actually know if a bus, train, or automobile gets them to work the fastest and most reliably. A volume to capacity ratio or LOS of each mode of transportation will help identify how scarce budget allocations should be spent, what projects have been successful, or where spending has been previously prioritized. A major performance measure for roads is origin-destination times along major corridors.

Roads

For the RPC region, measuring travel times along Rtes 93, 95, 1, and 101 would seem appropriate. Obtaining travel times will help make comparisons, as well as determine how close to posted speed limits traffic is able to travel. Origin-destination times for most of a transit trip are determined easily by checking the schedule. However, this does not include the time spent traveling to and from the transit stop. To give this measurement real context it should be discussed along with the frequency of trips, whether the train or bus is comfortable or overfull and how it compares in terms of consumer cost.

The miles of commuter bike paths in the region make traveling by bike safer, easier, and more inviting. Similarly, miles of sidewalk make it easier for pedestrians to travel safely and allow easy access to residences and retail businesses. Just as important as the amount of sidewalks and bike paths is the connectivity of these paths. If the paths do not create a usable network, then mobility will not be significantly increased. A complete network would allow users at a minimum to travel between and among residential areas and retail areas.

Transit

The percentage of the region's population within ¼ mile (or 15 minute walk) of transit services measures how mobile the population is when they do not use their automobiles. More importantly, and as a matter of equity, it also measures the mobility of those who cannot afford cars. Increasing the percentage of the population living near transit would serve low-income households who cannot afford cars or are cost-burdened due in supporting one or more private vehicles.

Reliability

Traffic congestion is common enough that travelers expect some delay, particularly during peak times, and either adjust their schedules or budget additional time to account for the slower journey. Travelers are generally less tolerant of unexpected delays, however, because they cause them to be late for work, miss appointments, or miss transit connections. Unexpected delays cause problems in the movement of freight as well, as delivery schedules are disrupted which can impact manufacturing processes, the quality of the goods being shipped, or sales.

Roads

Measuring the variability of travel times between major origin-destination pairs will tell planners how much time is lost due to rush hour and holiday traffic. This also affects predictability for shippers and anyone doing business or interested in doing business near potentially congested areas. This could also be measured using the Buffer (Reliability) Index. This is a measure of network reliability and is an estimate of the additional time that a traveler needs to budget during peak-period travel, to be assured of arriving on time with a 95 percent confidence level. The frequency of road closure during weather events (floods, snow storms, etc) is a direct indication of how reliable roads are. Can employees, shoppers, and others expect to be able to make their trips after snow storms or heavy rains?

Transit

Schedule adherence is the most obvious performance measure for transit reliability. This will identify if travelers can expect to arrive at their destination on time (and therefore be more willing to use transit), as well as how much time is lost due to waiting for late arrivals.

Safety

Accident rate per million vehicle miles traveled (VMT) and the number and rate of fatalities are two obvious performance measures for safety. Accident rate per million VMT gives planners an understanding of how frequently accidents are happening in relation to the level of traffic and can be utilized for passenger vehicles, trucks, transit, and bicycle and pedestrian travel assuming that estimates of the total amount of travel can be developed. The number and rate of traffic fatalities can be formulated using similar methods to the accident rate. The rate of traffic fatalities will give some perspective of the severity of accidents that are measured in the accident rate. Additionally, since fatalities garner a great deal of media attention, it will also inform planners of the public's view of road safety. When measuring traffic fatalities over time it may also be necessary to consider the safety

features of automobiles as well as any changes in the road and traffic levels. Evaluation of transit, bicycle and pedestrian, crash rates benefits from additional information on the accident context such as whether they occurred during boarding or disembarkation, and at bus and train stations, at crosswalks or near certain types of businesses, or areas where there are no sidewalks.

System Preservation

Maintenance costs and budgets are a critical factor when considering system preservation for any mode of travel. This performance measure can be applied to the regular upkeep and preservation of the various parts of the transportation system such as transit vehicles, train tracks, bus and train stations, rights of way, roads, bridges, sidewalks, snow plowing, and any repair of those assets. For roadways, sidewalks and bike paths, the most commonly utilized performance measure is the Pavement Condition Index (PCI) which requires a qualitative assessment of the state of the network. Well-maintained roads reduce maintenance costs for vehicle owners and improve travel times as well as avoiding the negative impression that potholes create. Tracking PCI may require the purchase of Pavement Management System (PMS) software. However, tracking needs and performed maintenance will help predict future costs and improve planning. The percentage of bridges that need repair in New Hampshire and throughout the country has been receiving much attention recently as when bridge disrepair causes an accident, it receives heavy media coverage. NH DOT closely tracks the condition of the region's bridges needs so that maintenance is performed on time, and any serious accidents are prevented. The RPC can utilize this analysis to track the overall condition of bridges in the region and progress toward repairing those in need.

The system preservation needs of transit can be measured by the percentage of transit vehicles that exceed replacement age and/or the vehicle age distribution of the fleet. This data will inform planners on both the safety of the transit system as well as the necessary expenditures for continued operability. For transit, system preservation also means long term monitoring, and maintaining the condition of bus and train stations and service stops.

Current planning regulations require the update of the MPO Long Range Transportation Plan every four years at a minimum. It is important that any future updates include an evaluation of progress and measure the success of the MPO at implementing the projects and policies included. Some Providing answers to the following questions will help with this assessment. Some of the responses will necessarily be subjective and others will have discreet answers but both must be weighed to indicate success. The questions that are asked for the update should include the following:

- Does the MPO have a rational process that moves projects from the LRP to the TIP?
- Have we been able to assist communities in addressing transportation problems?
- How many projects have been constructed or otherwise implemented?
- How many projects from the Long Range Plan are being actively planned or designed?
- How many communities are utilizing the various land use and transportation planning policies that are discussed in Chapter 2 such as smart growth principles and access management?

Recommendations

1. Begin tracking the performance measures included in Table 4.2
2. Investigate other performance measures and methods to refine the process.

Table 4.2: Performance Measures

Goal	Objective	Performance Measure
Accessibility: The ability to reach desired goods, services, activities and destinations	• Enable access to multiple travel modes • Increase % of employment & housing near transit • Reduce average travel times and distances	• Peak Hour Average Travel Time • Peak Hour Average Trip Length • % of the population within ¼ mile of transit • % of Employment within ¼ mile of transit
Environmental Resources: Tracking the impacts of transportation projects on natural resources**.**	• Reduce impacts on natural resources and preserve open space. Meet regional air quality budgets.	• Acres of wetlands impacted due to transportation projects • Acres of land preserved via transportation projects • Meeting regional air quality goals
Equity: Are the benefits and costs of the transportation system being distributed equitably among different groups.	• Ensure equity of access to transportation modes • Ensure ADA compliance	• Comparison of transportation investment by race or income levels • Jobs accessible within 30 minutes by road by race or income levels • Jobs accessible within 60 minutes by transit by race or income levels
Land Use: How do local land use policies and regulations correspond with those in the Long Range Plan	• Increase community use of compact, mixed-use growth patterns	• Communities using mixed-use zoning • Communities utilizing access management • Rate of land development
Mobility: The ability of people to physically move from one place to another via motorized or non-motorized modes	• Increase Transit Ridership • Maintain LOS on roadways • Increase % of employment	• VMTs by congestion Level • Volume to Capacity Ratios • % of employment sites within 5 miles of major highway • Level of Service • Transit Ridership
Reliability is having a consistent transportation system that allows users to dependably estimate travel times.	• Increase the reliability of travel, reduce bottlenecks and chokepoints.	• On-time performance for Transit systems • Consistent peak hour travel times on highways
Safety: Tracking the number, type, and location of crashes.	• Reduce the accident rate per million vehicle miles traveled (vmt) • Reduce the number of traffic fatalities	• Accident Rates per Million VMT • High accident locations • Incidents involving transit
System Preservation: The adequate maintenance of the transportation system.	• Extend the useful life of existing systems and equipment • Ensure that transportation facilities are usable	• Maintenance Costs • Percentage of roads and bridges below standard condition • Pavement Condition Index

1.3 Context Sensitive Solutions

"Context sensitive solutions (CSS) is defined by the FHWA as “a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility.” CSS is an approach that considers the total context within which a transportation improvement project will exist; it is aimed at solving transportation problems by defining “solutions” rather than transportation “projects.”

As a planning approach, Context Sensitive Solutions improves the process identifying workable, cost effective and locally acceptable project design. It shifts decision-making for transportation projects away from driven by engineering for the greatest capacity and throughput toward a more balanced approach of designing transportation facilities that meet the needs of the community and fit appropriately in their surroundings. An important distinction between CSS and other transportation planning processes is a modified set of priorities. Rather than establishing higher vehicle speeds and greater throughput as the primary goals of the planning process, community, environmental, and transportation goals are all given equal footing. The RPC’s recent corridor planning approach for U.S. Route 1 is an example of this approach.

The CSS process involves all the stakeholders that would be affected by a project. The goal is to have projects that were supported by the community in order to realize projects that exceeded the expectations of both engineers and the public. Stakeholders typically include residents, abutters, businesses, non-profits, local and state government, regulatory agencies, and anyone else with a stake in the final outcome of the transportation project. They are involved early in the planning process, beginning with the scoping phase of the project. By involving the community in which a project will be built, it creates the opportunity for the public to influence planning so that the final product fits within the context of that community.

CSS design guidelines are flexible and are meant to be adapted to fit the context of the community in which they are being applied. Roadways in central business districts should focus on social and economic interactions as well as pedestrian safety while highways should prioritize safe, fast reliable, throughput for automobiles and freight. Contextual elements that are taken into account by CSS include aesthetics, archeology, community, culture, environment, historic value, recreation, and scenic value. It is beholden upon the stakeholders to work with the transportation planners to ensure that these issues are taken into account as they consider how transportation projects will shape their community.

NHDOT has become a strong advocate in the CSS approach and has asked for the assistance and cooperation from regional planning commission across the state to carry it forward. Going forward, we expect to become involved both as stakeholders and (where not stakeholders) as facilitators in CSS project design.

Recommendations

1. Continue to integrate the CSS methodology into all aspects of the MPO Transportation Planning Process.
2. Begin working the CSS process into the development of transportation projects in the region.

1.4 Expanding Financing Options

One of the biggest challenges facing the communities will be in financing roadway improvements. 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 the large, long range projects. Given existing and expected resources on the Federal and State level, 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.

Federal Funding Programs

There are a number of different categories of Federal Transportation funding that could be utilized to construct improvements. Most any use of these funds will require that the project be listed in the State Ten Year Plan, as well as the Metropolitan Planning Organization (Rockingham Planning Commission) Transportation Improvement Program, and will mean that they are competing for priority with other projects around the state.

Surface Transportation Program (STP): This program is the source of most of the funds apportioned to the State and is the most flexible in what the money can be used for. STP funds may be obligated for construction, reconstruction, rehabilitation, resurfacing, restoration, and operational improvements for highways including Interstate highways and bridges. They also may also be used to pay intercity bus capital costs, carpool projects, parking facilities and programs, bicycle and pedestrian facilities on any public roads, and the modification of public sidewalks to comply with the Americans with Disabilities Act of 1990.

Transportation Enhancements (TE): This is a set aside from the STP, and may be used for any activities that provide facilities, safety improvements and education for pedestrians and bicycles, and scenic beautification or environmental mitigation. Also eligible are projects that preserve historic transportation related facilities and abandoned railroad corridors including rail to trail conversions. In New Hampshire, TE funds are programmed on a two year cycle through a competitive project selection process that begins with communities submitting project proposals to the Regional Planning Commission where they are prioritized regionally. Projects then are sent to the state TE committee for statewide review and prioritization. Funded projects are then added to the State Ten Year Plan. Highway Bridge Replacement and Rehabilitation Program (HBRRP): These funds may be used for the rehabilitation, reconstruction, or replacement of a bridge with safety or structural deficiencies, or that is functionally obsolete on any public road.

Congestion Mitigation and Air Quality (CMAQ): This is a program that sets aside funds specifically to address air quality issues and the reduction of congestion and eligible projects must help to improve air quality. There is a long list of projects types that are eligible for this funding including implementing transportation control measures, traffic management, monitoring, and congestion relief strategies, transit expansion or enhancement, alternative fuel projects, inspection and maintenance (I/M) programs, and intermodal freight improvements as well as many others. In New Hampshire, CMAQ funds are programmed using the same process as TE funds, with the additional step of an air quality benefits analysis for each project.

Federal Transit Administration (FTA) Funding: The FTA provides several funding streams that support transit operations and capital needs in the region. The largest of these is the Section 5307 Urban Formula funding program, which is the major source of funding for COAST and CART. Other programs include Section 5310 Capital Grants for Elderly and Disabled Transportation, the Section 5316 Job Access/Reverse Commuter (JARC) program focused on employment transportation, and the Section 5317 New Freedom Program focused on supplemental service for individuals with disabilities. A looming threat for COAST and CART is the potential loss of FTA operating funding following the 2010 Census, as described previously in Chapter 1.

State Funding Sources

Funding from the state is somewhat more flexible in how quickly it can be obtained and programmed for construction of improvements, but somewhat less flexible in how the funding can be used.

State Aid Funds for Class I, II, and III Highways (RSA 235:10-:21): These funds are provided for the purpose of constructing or reconstructing sections of Class I, II, and III highways. This work includes improvements to unimproved sections or to advance the priority of construction for special types of work such as improving drainage, riding surface, or elimination of sharp curves on Class I highways or improved sections of Class II highways. Qualifying and approved projects receive 2/3rds state funding of the project cost, with the municipality expected to contribute 1/3rd.

Bridge Aid Funds (RSA 234): These consist of both State and Federal Highway Funds budgeted for construction or reconstruction of structures on Class IV and Class V highways as well as municipally-maintained bridges on Class II highways. Structures having a clear span of at least 10 feet qualify for state funds, and those having a span of at least 20 feet qualify for federal funds. The ratio for the aid is 80% Federal or State and 20% municipality. Construction of Class II bridges transfers the maintenance responsibility from the municipality to the State.

Highway Block Grant Aid Funds (RSA 235:23 & :25): come from a portion of the total road toll and motor vehicle registration fees collected by the State and given to municipalities for the purpose of constructing, reconstructing, or maintaining Class IV and V highways. These funds are apportioned to all municipalities on a yearly basis as follows:

- Apportionment A: These funds are allocated from an annual apportionment of not less than 12% of the total highway revenues collected the preceding fiscal year. The amount distributed is based on one-half (1/2) mileage and one-half (1/2) population.
- Apportionment B: These funds are allocated from an annual apportionment of $400,000 distributed based on a formula using equalized valuation and Class V mileage. It is designed to give the greatest benefit to municipalities with low, equalized valuations and high road mileage.

State Support for Transit: New Hampshire provides very limited funding for public transportation. Traditionally the State has assisted transit agencies with vehicle purchases, providing half of the required non-federal matching funding for capital costs (10% of total cost). The State also provides a small amount of operating assistance to transit agencies based on ridership, amounting to about $38,000 annually for COAST, and $8,000 annually for CART. As noted in Chapter 1, New Hampshire ranks near the bottom nationally in state support for public transportation, spending $0.45 per capita on transit, approximately one tenth of the median investment of $4.59 among all states nationally.

Municipal Funding Sources

There are a variety of opportunities available to the community to raise funds for road projects locally. The advantage of this is the speed at which funds can be raised, and put towards improvements compared to the federal and state processes.

CIP/Warrant Article: The Warrant Article has historically been the approach to locally funding transportation improvements in New Hampshire. This involves placing the project on the ballot for the community to approve funding via local property tax, and can be utilized either to directly finance a project or to pay for one that is being reimbursed by Federal or State funds, or other revenue generating mechanism.

Local Option Fee - Motor Vehicle Registration: The Local Option Fee for Transportation Funding is one means of generating local funding via local vehicle registration fees. A New Hampshire law passed in 1998 (HB 648) allows a municipality to collect an additional motor vehicle registration fee of up to $5.00 for the purpose of supporting a municipal transportation improvement fund. The revenues collected (minus up to 10 percent for administrative costs) are deposited into a municipal transportation improvement fund for improvement projects on roads and bridges, bicycle and pedestrian facilities, parking and intermodal facilities, and public transit. It is recommended that communities establish a plan for using these funds and a process for regular updates.

Traffic Impact Fee: A onetime fee to new developments to pay for the cost of serving the additional traffic that it generates. These fees are calculated based on the number of trips generated by the new development as established in an approved traffic study. The cost of correcting existing deficiencies is usually excluded from the calculation for equity and legal reasons. A Roadway Impact Fee is a variation of this that is levied on a fair share basis based on the new development's anticipated portion of total traffic on a roadway.

Development Agreements: This is a negotiated agreement between a developer and the community to mitigate the impacts of a proposal by meeting community conditions of approval. This is accomplished during zoning or subdivision approval, when local government has broad discretion in approving a project. This method is flexible in meeting community needs, but can be applied unevenly.
Transportation Development District (TDD): Also known as a Special Assessment District, properties abutting a designated section of roadway are assessed for their fair share of the cost of the road improvement. Fees can be assessed based on linear frontage, area, or by trip generation and are usually for specific improvements benefiting property within the district. Generally this applies to all properties fronting the roadway to be improved, but can be expanded into a larger district if the improvements or impacts are to a larger area. If the district crosses municipal boundaries, it is considered a Regional Development District. Through an inter-municipal agreement allowed by RSA Section 53-A, the communities along Route 1 could form a district to provide a larger pool of funds for transportation improvements.

Tax Increment Financing: The projected increase in property value from a development is partially taxed for a prearranged time period. The community (or developer in some cases), pays for initial off-site improvements, and the expenditure is recouped from difference in developed and undeveloped tax base. Frequently a TIF District is established to gather funds from multiple sources.
Transportation Utility Fees: In this case, roads are treated like a public utility and developed properties are charged a fee for service, similar to water, sewer, and other utilities. They are imposed on a

jurisdiction-wide basis and continue in perpetuity. The fee varies by type and size of land use and is assessed to all property owners.

Recommendations

1. Work directly with communities to expand the options available for local financing of transportation system improvements.
2. Work with 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, and ensure continued access to FTA operating support following the 2010 Census.

2. Addressing Regional Accessibility and Mobility

This section addresses the goals of improving the mobility (ability to travel) and accessibility (ability to reach desired goods, services, activities and destinations) for the people that live, work, or visit the region. Improving mobility often involves increasing the capacity of the transportation network to ease the movement of vehicles, primarily passenger cars. Improving accessibility takes a more multi-modal approach that involves improving mobility, but also considering the location of particular land uses and how that influence the need and ability to travel.

2.1 Land Use & Transportation Coordination

As is discussed in other sections of this Plan, land use and transportation are closely linked. The transportation system and the access it provides have a significant effect on land use -- and vice-versa. It has also 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 from 20 to 30% less automobile travel per capita than regions that are highly sprawled in their pattern. While the RPC region historically was fairly 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 has lead to growth in the number of vehicle miles travelled at a rate two to three times that of our population growth and is unsustainable in the long term. As a transportation planning policy therefore, this Plan advocates land use strategies which, among other benefits, generate lower demand for automobile travel. In the past such strategies have been seen as important mechanisms to reduce traffic congestion, maintain air quality conformity and slow land consumption. Today, rapid increases in energy costs and concern about global climate change make the implementation of these land use/transportation strategies that much more critical. The key strategies are as follows:

- ***Compact Development*:** this refers to a strategy to increase the average density of new development in the region. Higher densities are strongly correlated with lower VMTs. Compact development in a New Hampshire context does not mean high rise apartment and commercial buildings, but rather, relatively small single family lots with some multifamily lots in village or town centers surrounded by largely undeveloped land – in other words the classic New England development pattern. Higher density can do two important things: reduce the distance between possible destinations making pedestrian and bicycle use appropriate for more trips;

cluster potential users of transit in smaller geographic areas thus making that transit modes more effective in more places.

- ***Mixed Use Development:*** Mixed use development refers to breaking down "Euclidian" zoning (where uses are relatively uniform and separated from dislike uses) and allowing appropriate complementary uses in proximity to each other. Typically this means allowing residential, professional/office and small scale retail development in the same general area. The resulting land use pattern will usually include residential areas to be located close to or within employment centers, greatly increasing the opportunities for residents to work near where they live, and having access to key services near where they live or work.

- ***Infill Development:*** Infill development refers to, as a land use planning priority, the "filling in" of vacant or underused lots in town centers and downtowns with appropriate development before development outside the town center occurs. It is a technique for helping to achieve more compact development.

- ***Transit Oriented Design:*** Transit oriented design or TOD is strategy of allowing (through zoning) and encouraging (through community development or financial incentives) a relatively high density of mixed uses to be located around an existing or planning transit (rail or bus) station. It is intended to enhance the viability of transit use, while at the same time encouraging a compact, mixed use land use pattern.

- ***Density Transfers:*** Density transfer to Transfer of Development Rights (TDR) refers to a voluntary zoning incentive technique whereby development density is increased ("transferred") in an area where compact development is sought (like a village or town center) and reduced or eliminated, usually via conservation easement, in areas where additional development is discouraged. Where successful density transfers can bring about the dual benefit of creating transportation-efficient land use patterns while protecting desired open space and conservation land.

- ***Interconnected Street Design****:* One unintended consequence of low density suburban residential development has been the growth of unconnected, inefficient residential street systems consisting of many cul-de-sac or dead end roads. While highly desirable to the residents in such neighborhoods, the community wide effect is to overburden the relatively few collector and arterial roads and inhibit the creation of redundant travel routes normally provided through a network of interconnected streets. This technique involves planning for a fully interconnected residential street system through the local subdivision approval process and sharply reducing the circumstances under which permanent cul-de-sac streets are permitted.

- ***Complete Streets:*** Complete Streets refers to the concept that roads should be designed to serve all of the traveling public, not just those that drive. Depending on the surrounding land use, this may mean inclusion of shoulder bicycle routes, sidewalks and crosswalks, traffic calming devices, and transit amenities. In low density areas this would mean including adequate shoulder width for bicycle or pedestrian use into the design of most roads. In higher density areas, sidewalks would be included. In the highest density areas, transit facilities such as bus pull-outs and shelters are appropriate, as well as amenities such as pedestrian activated traffic

signals. The Complete Streets concept is described in greater detail in Section 4.2.4 – Bicycle and Pedestrian Facilities.

- ***Access Management:*** Access Management is land use strategy which coordinates access location and design to provide adequate access to land uses adjacent to a highway while minimizing conflict with through traffic. In requires planning ahead for the location and design of access points and intersections and, for state highways, requires close coordination of driveway permitting and site design by state and local authorities. It is more fully described below.

- ***Right-of-Way Preservation:*** Sometimes considered as an element of access management, right-of-way preservation involves a proactive, planned approach, at the state or local level, in securing easements for future travel corridors. Right of way preservation can be an important local planning tool used to encourage businesses to develop in a pattern and location that meets the communities' desires. It can prevent incompatible land use development and reduce future land acquisition costs. It likewise benefits landowners and developers by creating a predictable environment in and clearer understanding of the location, available access, and level of service of future transportation projects. New Hampshire's laws support right of preservation at the local level in the form of the local "official map" which can be used to layout future roadway and guide ROW acquisition, and at the State level in RSA 230-A – Corridor Protection. Projects that involve federal funds or permits are hampered in corridor preservation out of concern for preempting the evaluation of alignment alternatives required in the NEPA process.

Recommendations

1. Work with communities to implement land use regulations that provide transportation benefits to the locality and the region.
2. Support transportation projects that promote compact growth and development patterns.

2.2 Scenario Planning

Introduction

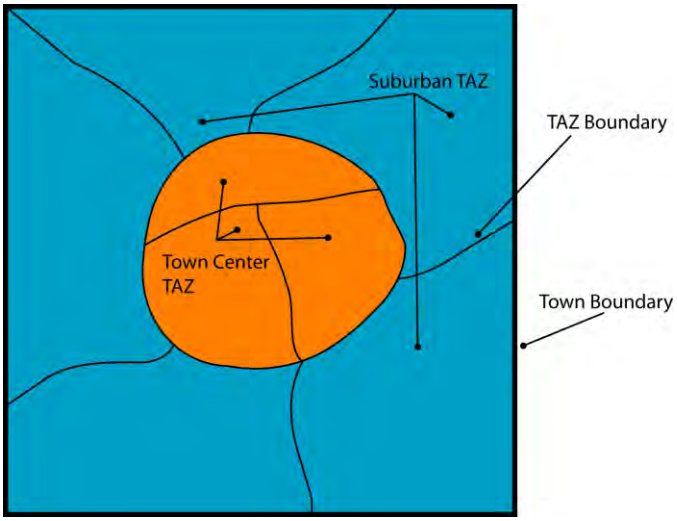
One area that has not been explored previously in the Plan is the impact that different growth patterns have on the transportation network in the RPC region. Utilizing the joint RPC/SRPC Regional Travel Demand Model, scenarios can be created that adjust land use distributions and the outputs for changes in the amount and type of travel, as well as for impacts on specific facilities can be examined. This can help to determine the type and location of improvements that will be necessary in the future.

Model Summary

The Rockingham and Strafford MPO use a four step Transportation Model with an additional module to allocate land use, and another module to summarize results. The model is based on TransCAD and utilizes a set of macros and routines prepared by Resource Systems Group to tailor the process to the region. Land use inputs are allocated for each traffic analysis zone (taz) in two housing categories (single family and multifamily) and six employment categories (low commercial, hi commercial, retail, industrial, institutional and hotel/motel). The total amount of employment and housing for the region is derived from the outputs of the growth projections described above and are set in the sub-regions to set an overall growth cap for each area without determining where exactly within that area the growth

occurs. The Land Use Allocation module assigns growth to the specific traffic analysis zones within each sub-area, except in locations where growth is specifically restricted (for example the Pease Tradeport). Known land use restrictions (zoning and environmental) are accounted for, and the new land use is placed into specific zones based on an algorithm that takes into account preexisting land uses (what is there already) in the zone, and its accessibility from all other zones (how easy is it to get there). The process is iterative and builds on past growth levels and patterns.

The RPC is newly exploring the capabilities of the model to perform various types of analysis such as included in this scenario planning section, and as such the tools and methods that are being used are being developed and refined as work is done. For that reason, analysis is somewhat limited in this iteration of the Plan and the goal is to improve both the capabilities of the model and our analysis methods in this area.



Traffic Analysis Zones are the basic unit of geography within the model and serves as a basis for generating traffic. The Regional Travel Demand Model has 533 internal zones and 23 external zones. Within the model, zones vary in size based on the size and population of the community. Generally, when we talk about "Town Center" TAZs in this case it means the area where the concentration of employment and housing is desired for a particular community. The "Suburban" TAZs are those that are outside of the town center. The construct allows the model to focus growth to particular types of zones without having to prescribe a certain amount to any one location.

Growth Scenarios

For the purposes of the Long Range Plan, three basic scenarios were developed and are described below. As work was progressing on this aspect of the Plan, limitations in the Regional Travel Demand Model became apparent and it was difficult to extract the data from the model in ways that are useful. This has limited the analysis that we were able to do with the scenarios described in this section of the Plan. Staff is working to overcome these problems but for this plan, the scenario planning analysis will be limited to a general comparison between the existing growth pattern and a compact growth pattern and the potential impacts that they have. Future revisions of the Plan will include more detailed analysis and additional work with other scenarios as they are available. This analysis will also be included in the Regional Master Plan for the RPC region which is expected to be completed in 2009.

Scenario1: Existing Growth Pattern

Growth within the RPC region is likely to continue growing in the same pattern that it has in the past and the distribution of land in this scenario reflects that by placing most growth outside of community centers. This means that commercial growth will frequently come as strip development and big box stores. Residential development will continue to be based on large lot zoning which many communities feel helps maintain a rural feel. However, it also encourages the further development of farmland and forests in order to have enough land to meet zoning requirements. Residential development will continue the present trend of private, unconnected subdivisions containing high-end homes. Many of the residents in these communities work in Manchester, Concord and Massachusetts and will commute daily to their jobs. Commuting will continue to be primarily by car. Ridership on buses and on the

Downeaster may increase if fuel prices continue to rise or congestion worsens. Though low density development will continue to make public transportation difficult to achieve as well as discouraging pedestrian and bicycle travel.

This development pattern obliges municipalities to build new roads, sewer, and utilities infrastructure. It will also allow people to live in neighborhoods that accommodate commuting by automobiles and prioritize separation from commercial activity and privacy. Large lots will contribute to keeping land prices high, making it more expensive for those towns who wish to place land in conservation easements. Low density development will continue to make public transportation difficult to achieve as well as discouraging pedestrian and bicycle travel.

Scenario 2: Compact Growth (Town Centered)

In a town centered smart growth pattern, each town within the RPC would move toward the village center model. Mixed use zoning would be adopted in order to create more walkable central business district that includes retail shops, restaurants, office space, municipal buildings, parks, and residential space. A densely-built town center allows for more land outside the established village to remain undeveloped. Efficient land use patterns allow municipalities to more easily protect forests, wetlands, open space, and farmland.

The land use distribution in the model is modified to facilitate this scenario by establishing TAZs that are "town centers" and shifting growth to those zones and away from the more rural zones in the community. For this growth scenario a number of changes were made to the land use distribution of the model.

1. TAZs defined as town centers were provided with additional capacity for growth by adjusting both the amount of land available for those with no land available
2. The rate at which development consumes land within the zone.
3. All three land use types (residential, retail, non-retail) were allowed in these zones to create mixed use environments.
4. Residential use in the non-town center TAZs was rezoned to 4 lots/ acre minimum to mimic "conservation subdivision" type development in those areas.

Other Scenarios

Other scenarios are being considered for development depending upon the limitations of the travel demand model. Foremost is a revision of Scenario 2 that expands the number of transit routes available in the RPC region to connect the "town centers" to other employment and housing centers in the region. Current scenarios show only a minor mode shift to transit with a more compact development pattern due to extremely limited transit routes in the region. Another more significant land use shift that created regional growth centers that consolidate most of the new housing and employment for the region is being considered as well. This would reduce the number growth centers from 27 to 5 or 6 and would likely generate very different travel patterns as well.

Recommendations

1. Continue to develop the scenario planning and analysis capabilities of the Regional Travel Demand Model.
2. Include analysis of scenarios into the Long Range Plan in the next update including consideration of how the differing travel demands impact project needs.

2.3 Expanding Access to Transit

Developing a safe, reliable public transportation system for the region that provides mobility for transit dependent individuals as well as a clean, congestion-reducing, cost effective alternative for those with the option to drive will require implementation of numerous strategies identified elsewhere in this chapter. Encouraging compact, mixed-use development is important, as low-density rural development cannot be cost-effectively served by fixed route bus or rail. Promotion of transit by employers through Transportation Demand Management programs is another important facet. Ensuring that streets are designed to include bus pull-outs and transit amenities where needed is also a long term need. Other strategies relate specifically to the operation of transit systems. Key initiatives in the RPC region related to transit operations include the following:

- ***Strengthening COAST and CART:*** The RPC provides technical assistance to both COAST and CART, and has played a leadership role in the development of CART in the past five years. Interest in expanding the services provided by each entity has grown recently. COAST recently launched new service in Dover, piloted a summer service connecting Epping-Exeter-Hampton, and has received requests to revisit extending service down Route 1 to connect communities between Seabrook and Portsmouth. The next stage in CART's development will be initiation of the SE-TRIP fixed route service between Salem and Derry, with the eventual goal of connections north to Manchester and south to Methuen. Several neighboring communities outside the CART service area have also inquired about joining the service area. The RPC will assist in planning for each of these expansions.

- ***Coordination of Transit Services***: SAFETEA-LU introduced new requirements to develop plans for coordination among public transportation providers and health and human service agencies providing demand response transportation to special needs populations. The goals of this include improving efficiency by centralizing functions such as scheduling, dispatching and billing, or developing joint agreements for maintenance and vehicle purchases. This is particularly important in New Hampshire, where funding spent on human service transportation outweighs funding spend on public transportation, and DHHS funds are a potential source of match for FTA dollars. The RPC has been a partner in developing two Public Transit/Human Service Transportation Coordination Plans – one for the communities of the CART region in the western part of Rockingham County, and a second for the COAST region, broadly defined as including Eastern Rockingham County and Strafford County and referred to as the Alliance for Community Transportation (ACT).

  At the state level, a Statewide Coordinating Council (SCC) was formed by the Legislature in 2007, which is working to restructure the way NHDHHS funds Medicaid transportation, and eventually transportation for other programs as well, including Transitional Assistance for Needy Families (TANF), and senior transportation under Title IIIB of the Older Americans Act. Implementation of the Medicaid brokerage is anticipated for 2009, with other programs to follow in subsequent years. Contracts for Medicaid brokerage services will be let at the regional level, overseen by Regional Coordinating Councils (RCCs), and implemented by contracted Regional Transportation Coordinators (RTCs).

- ***Development of Regional Intercity Bus & Rail Service:*** The success of the Amtrak Downeaster passenger rail service and inter-city commuter bus services, the establishment of the NH Rail Transit Authority, and the I-93 Transit Investment Study have revitalized interest in expanding

inter-city transit service both within New Hampshire and connecting to neighboring states. The RPC will continue to work collaboratively to sustain and expand regional intercity transit service in the I-93 corridor, I-95/Route 16 corridor, the B&M Main Line corridor, and East-West connections between the Seacoast and the Merrimack Valley.

- ***Intelligent Transportation System Opportunities***: ITS tools for transit include technologies such as automatic vehicle locators (AVLs), mobile data terminals, or signal prioritization. CART currently uses paratransit scheduling software that is equipped to integrate these technologies, and is exploring implementation of AVLs and mobile data terminals. Both transit agencies participated in the development of Regional ITS architecture mandated by SAFETEA-LU.

Recommendations

1. Continue to provide technical assistance to COAST and CART in the development of regional public transportation networks.
2. Continue working with CART, ACT, the SCC and other regional and state partners to implement regional public transit/human service transportation coordination, including updates to regional transit coordination plans.
3. Work with state and regional partners to develop and sustain expanded inter-city rail and bus transportation options.

2.4 Bicycle and Pedestrian Facilities

In 2000 the U.S. Department of Transportation began advising states that received federal funds that "bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist." Two emerging frameworks for encouraging bicycling and walking as safe alternatives to driving include the idea of *Complete Streets*, which focuses on engineering roadways for use by all modes; as well as looking beyond engineering to other programs and policies known as the "Four Es" needed to support non-motorized transportation. In addition to Engineering, or road design, the other three "Es" include Education, Enforcement, and Encouragement.

- Complete Streets: Designing for Complete Streets starts with the assumption that roads should be designed to serve all of the traveling public, not just those that drive. Some common components of complete streets are narrow lanes, wide shoulders, frequent crosswalks, bike paths, medians, raised crosswalks, bus pullouts, audible pedestrian signals, and bulb-outs. The design of a roadway to support multiple modes of travel will vary based on traffic volumes and the extent to which roadways connect residential areas with other nearby trip destinations (employment centers, shopping, schools, libraries and other civic centers). Most low-traffic rural roads may not need marked bikeways and sidewalks, but even in rural communities a sidewalk and shoulder bicycle route connecting a school to nearby residential areas and the town library or community center would improve safety and independence for school children and encourage an alternative to driving. In a more urban area streets should be designed to include sidewalks, bicycle lanes, transit pull-outs, and traffic calming features. The important distinction is that rather than the default assumption that roadways are for cars, the Complete Streets approach ensures that roads are for everyone.

Complete Street policies have been adopted elsewhere in the country through internal procedures, citizen advisory committees, and passing legislation or resolutions. Such decisions can be made at the municipal or state level. There are a number of resources available to those who want to implement Complete Street guidelines, including the National Complete Streets Coalition and the Thunderhead Alliance. The National Complete Streets Coalition offers workshops on policy development and implementation. Information on model language for Complete Streets policies can also be found in *DOT Design Guidance: Accommodating Bicycle and Pedestrian Travel.*

- Four E's: 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. Beyond the Engineering component addressed through Complete Streets policies, the other three "Es" include Education (regarding cyclists rights and responsibilities), Encouragement (to try a new way to travel), and Enforcement (of traffic rules for both drivers and cyclists). The Safe Routes to School (SRTS) Program incorporates this integrated approach. Portsmouth, Rye, Hampton, and Plaistow are already developing SRTS programs, and the RPC will provide technical assistance to other communities interested in developing their own initiatives.

  Education – School-based bicycle safety education programs and regional bicycle safety workshops such as the Bike Bonanza co-hosted by the RPC annually; pedestrian safety outreach related to rail crossings such as Operation Lifesaver; incorporation of information on sharing the road into drivers education courses; and bicycle safety training for older youth and adults.

  Encouragement – Encouragement programs include activities like International Walk to School Day for children, or Bike/Walk to Work Day for adults; incentive programs like KidPower run by the DHHS Bureau of Health Promotions; "walking school buses", where one or two parents accompany a large group of children walking to school, or "rolling bike trains" a similar concept on wheels.

  Enforcement – Enforcement activities include stepped up patrols to reduce speeding and ensure cars stop for pedestrians in crosswalks. The passage by the NH State Legislature in 2008 of the "Three Foot Rule" requiring cars to give safe berth when passing bicyclists is another important step. Greater effort is also necessary to ensure that bicyclists follow traffic laws, as they are subject to the same rights and responsibilities as other vehicle operators. Finally, sometimes police officers themselves are unfamiliar with laws related to bicycles, and outreach to police departments can be useful.

Recommendations

1. Provide technical assistance to communities in bicycle and pedestrian planning, including development of Complete Streets policies and securing Transportation Enhancement and other funding assistance.
2. Provide technical assistance to communities in developing Safe Routes to School initiatives.

3. Managing Congestion on the Roadway Network

3.1 Access Management

Access Management is the application of land use planning and traffic management to create a safe, efficient transportation network. Rather than allow homes and businesses to place driveways and other connections without respect to the function of the roadway, communities and the State can manage access to minimize negative impacts, improve flow and safety both on specific corridors and community-wide. The potential benefits are significant when sound access management is applied consistently as roadway capacity is increased without adding travel lanes, safety is improved, and economic development is aided by more efficient travel. This saves money, lives, and reduces community and environmental impacts from road widening.

Specifically, access management involves maintaining control over the location and design of all entrance points to a public highway. The intent is to preserve the safety and efficiency of the roadway, while at the same time providing reasonable access to adjacent properties. Practically, it means limiting the number of, or appropriately spacing driveways, as well as ensuring proper design the roadway and access points so that it is safe and traffic moves as efficiently as possible. Access management tools can be designed to be implemented prior to the development of a highway, as well as retroactively to improve the function of existing roadways. Towns are able to control access to roads through local zoning and site plan review, the purchase of access rights, and/or the NHDOT driveway permitting process. The tools are comprehensive and include policies, regulations, design standards, as well as physical improvements to the roadway.

WHY ACCESS MANAGEMENT?

Every entrance point that intersects with a roadway has the potential to slow traffic, increase the potential for accidents, and increase congestion. As cars pull in and out of driveways they interfere with traffic flow. The most obvious example of this problem can be seen in the development of commercial strip development alongside arterial highways, such as NH 28 in Salem, Woodbury Ave. in Portsmouth as well as along segments of NH 111, NH 125 and US Route 1. Such roads must accommodate two very different and inherently conflicting uses: vehicles travelling though and vehicles accessing local businesses. In order to allow for easy and safe access to these businesses while preserving through capacity, the NHDOT and towns may limit the number, placement, or distance between such driveway and thus find a balance between the needs of customers or homeowners with the need for easy access with those of motorists who wish to pass through safely and quickly. "Access management" and the preparation of an access management plan for a specific corridor provides the tools to plan ahead for access measures and have them implemented as development occurs. Communities should work together with State, local agencies and developers to accomplish this goal.

The benefits from access management are widespread for all users of the transportation system as well as the community as a whole: ***Motorists*** gain from fewer, less severe traffic accidents as well as improved traffic flow, saving both time and money; ***Businesses*** benefit from preserving their market and/or delivery areas, as customers find it easier to access a business due less congested roadways and lower accident potential. Often corridors with good access management are friendlier to ***pedestrians*** which can create additional business opportunities as well. ***Land Owners*** benefit from the increased economic development potential of their property on an efficient corridor, as well as increased property values from a larger market area created through reduced congestion. ***Developers*** gain from having established access and design criteria which reduces their design costs and delays by giving them a specific set of requirements to plan towards. ***Everyone*** gains from prolonging the life of the existing roadway through preserving its capacity. This allows funds that might have been spent on new facilities to go into better maintaining the existing network. In addition, there can be benefits for both public transportation travel times and access. Finally, good

access management can create a more aesthetically pleasing area with fewer signs, more green space, and an overall more walkable community.

"Access Management" is not a single technique or practice but rather consists of a set of principles, practices and techniques, variously applied depending on the conditions in a specific roadway corridor:

There are six general practices that are applied at different regulatory and operational levels to facilitate good access management.

- ***Limiting the Number of Conflict Points***: The intersection of driveways with a street, or the intersection of two or more streets, creates the potential for interaction between vehicles moving in different directions or at different speeds. These are known as conflict points, and with more intersections there is a greater accident potential which translates into higher accident rates.
- ***Separate Conflict Areas***: Providing sufficient time between potential conflicts for drivers to properly perceive and react to conflicts helps to simplify the driving task and improves operations and safety. This entails ensuring proper separation between driveways and intersections.
- ***Remove Turning Vehicles from Through Traffic Lanes***: Allowing through traffic to be unimpeded by turning vehicles improves operations and reduces conflicts and the duration of conflicts that do occur due to turning vehicles. This involves constructing left and/or right turn lanes or providing space for vehicles to slow and make turns without stopping traffic behind them.
- ***Reduce Conflicting Volumes of Traffic***: Providing for internal circulation between sites without having to access the roadway network reduces trips and resulting conflicts. This involves primarily making connections between parcels and sharing access points.
- ***Improve Roadway Operations***: Preserving the function of the roadway and providing standards appropriate to the volume and type of traffic utilizing a managed roadway results in improved safety and operations. With various traffic control options being considered for Epping Road, it becomes critical to consider proper spacing and other operational aspects so that the roadway continues to operate at high levels of efficiency as traffic volumes increase.
- ***Improve Driveway Operations***: Driveway designs that allow drivers to smoothly maneuver between the major roadway and driveways more efficiently have both safety and operational benefits. In addition, good design will accommodate pedestrians, cyclists, and transit users. Due to the impact of driveway design on roadway operations, design must be considered looking at how the many aspects work together and not as individual standards that need to be met. Just meeting the standards can result in driveways that conform to approved standards, but do not function well, because the combination of width, turn radii, and driveway opening don't work well together for instance.

A number of commonly accepted techniques are employed to put these principles into practice including limiting the number of lots and access points, regulating the location and spacing of driveways, requiring shared access to adjacent lots and consolidating existing access points, setting back driveways

away from intersections, requiring cross-lot connections, and establishing service or frontage roads to connect lots separate from the main highway.

Recommendations

1. Work with individual communities to implement an Access Management MOU with NH DOT to better coordinate the NH DOT state highway driveway permitting process and the local development approval process.
2. Develop an access management manual that provides communities with the information necessary to implement access management ordinances and policies as well as evaluate development proposals for access considerations.

3.2 Congestion Management Process

A congestion management process (CMP) presents a course of action for tracking and managing traffic congestion and transportation system performance. The goals of a CMP are to measure system performance for all modes, identify the causes of congestion, assess alternative actions and then implement those that are cost-effective. Once implemented, the process needs to evaluate each measure's effectiveness. Generally, CMPs are based around a data collection and monitoring system and a toolbox of strategies to be implemented when thresholds are met that alleviate congestion and enhance the mobility of persons and goods.

A CMP is required in metropolitan areas with population exceeding 200,000, known as Transportation Management Areas (TMAs). In TMAs designated as ozone or carbon monoxide non-attainment areas, the CMP takes on a greater significance, as Federal guidelines prohibit projects that increase capacity for single occupant vehicles unless the project comes from a CMP. Federal requirements also state that in all TMAs, the CMP shall be developed and implemented as part of the metropolitan planning process.

Recommendations

1. Work with the other NH MPOs to develop a framework for a New Hampshire Congestion Management Process.
2. Work with the Massachusetts MPOs to ensure that CMPs are coordinated across State boundaries.

3.3 Transportation Systems Management (TSM)

Transportation Systems Management (TSM) refers to a variety of techniques used in coordination to improve and optimize the transportation system without necessitating expansion or new construction. TSM, also known as Transportation Systems Management and Operations (TSM&O), seeks to improve traffic flow, air quality, accessibility, security, reliability, and safety through improved management of the existing transportation facilities. The strategies employed using TSM generally reduce the impact on the surrounding community and cost less than comparable improvements accomplished through roadway expansion.

Many Transportation System Management techniques rely on improved technology, such as those considered in the region's Intelligent Transportation System (ITS) architecture.[4] Other measures involve intersection and signal optimization, highway bottleneck removal programs, access management techniques, railroad crossing modifications, ramp metering, HOV lanes, and signage and lighting upgrades, special events management strategies, incident management and data collection for monitoring performance. The functions of these strategies include:

- Optimizing traffic flow on congested arterial and freeway networks;
- Coordinating traffic and transit management and operations;
- Reducing delays and adverse effects of incidents, weather, work zones, special events, emergencies and disaster situations;
- Informing travelers with timely and accurate information;
- Providing priority services to special user groups and vehicles;
- Improving the interfaces between modes for passengers and freight;
- Eliminating "chokepoint" bottlenecks due to inadequate interchange geometrics;
- Enhancing operational safety of vehicles with in-vehicle systems;
- Supplying a regional architecture of advanced information and controls; and
- Providing reliable and quick medical/security responses.

Regional transportation systems management and operations (M&O) means an integrated program to optimize the performance of the existing infrastructure though implementation of multi-modal, cross-jurisdictional systems, services, and projects that are designed to preserve capacity and improve security, safety, and reliability. These types of project can help to link planning and operations by helping the involved agencies to better understand the needs of the system as a whole and the processes involved. Regional M&O strategies include a broad range of activities that are also often considered Intelligent Transportation Systems (ITS) improvements as well. Traffic Incident Management, Traveler Information Services, Roadway Weather Information Services, Traffic Signal Coordination, Electronic Toll Collection, Transit Prioritization, and Work Zone Management are all techniques that can be implemented regionally and are also in the MPO's Regional ITS Architecture and Strategic Plan. Similarly, Emergency response to catastrophic events, management of freight movement also work better when implemented on a regional basis.

The most visible implementation of regional systems management and operations in New Hampshire has been the E-Z Pass system of electronic toll collection which has increased the capacity of the toll facilities tremendously and has had system wide implications for travel. A regional approach is also being utilized for the Incident Management systems being prepared for I-93, I-95, and the Spaulding Turnpike.

Regional efforts to better manage and operate the transportation system are important for several reasons:

- ***Rapidly increasing congestion:*** The demand for roadway capacity continues to grow; however the resources available for building new or expanded infrastructure are limited, making more roadways congested, peak periods last longer, and increasingly impacting travel times.

[4] see Strafford-Rockingham Region ITS Architecture – Final Report, SRPC & RPC, March, 2008

- ***Constraints on Capacity Expansion:*** Environmental, community, and fiscal constraints limit the ability to expand the capacity of the transit and roadway networks.
- ***Growing connectivity, interdependency and Operational Impacts across modes:*** Increasingly it is recognized that weather, traffic incidents, emergency operations, and special events have a great impact on the amount of congestion experienced on any particular roadway. It is estimated that about half of all congestion is caused by temporary disruptions and this has impacts on personal schedules, goods movement, as well as the ability of commuters and other travelers to rely on the transportation system for efficient movement.

Direct MPO involvement in planning for systems management and operations ensures that projects are adequately supported in the long-range planning and programming process and considered when establishing funding and project priorities. Consideration of these types of projects in long range planning also involves and educates operations personnel about broader regional planning and policy objectives that cut across modes and jurisdictions.

Given the current and foreseeable financial constraints limiting conventional highway expansion in New Hampshire, TSM is a particularly important and cost effective strategy for the State and region to use in responding to highway capacity problems.

Recommendations

1. Continue to work toward the implementation of management and operations strategies from the Regional ITS Architecture.
2. Work with communities to identify areas where a regional approach can aid in solving transportation problems.

3.4 Travel/Transportation Demand Management (TDM)

Like Transportation System Management, Travel Demand Management (TDM) is not a single technique, but rather a set of techniques aimed at maximizing the effectiveness of the existing transportation system. It is generally accomplished by the implementation of strategies and policies that encourage fewer people to drive SOVs, to drive outside of peak hours, or to make fewer trips. In addition, land use strategies aimed at reducing vehicle miles traveled, such as some of those described in section 4.1, have been adopted as TDM and Transportation Control Measures in other parts of the country. Marketing and Education are often critical to the effectiveness of TDM programs.

Technological strategies for reducing demand involve real time traveler information as well as the national 511 phone number. Both of these strategies give commuters up to the minute information on route congestion that will allow them to plan to travel by an alternate route, at an alternate time, or by an alternate mode.

Financial incentives can also be used as an encouragement for drivers or employers to change driving patterns. Tax incentives, parking pricing, congestion pricing for tolls, and incentive reward programs can be used as financial incentives for changing behavior.

Offering an easier or shorter trip is also a powerful incentive. High Occupancy Vehicle lanes, Signal Priority Systems for buses, and Preferential Parking for car or vanpoolers are all possible tools.

Other strategies for Travel Demand Management include specific programs to encourage commuters to use alternate modes, routes, or departure-times; combine trips or avoid trips altogether through telecommuting. Many of these strategies require employer involvement for them to be successful. Offering a Guaranteed Ride Home or subsidized transit pass programs makes using transit or carpooling more attractive. Guaranteed Ride Home programs ensure carpoolers and transit riders that in case of family emergencies or unforeseen delays at work they will still be able to get home. To allow commuters to drive outside of typical peak periods, employers must be willing to allow their employees to work schedules besides a typical 9:00am-5:00pm shift. This can mean working eight hour days from 7:00am-3:00pm, or it could mean working 10 hour days, four days a week. This compressed work week translates into one less round-trip commute per week, and typically also shifts one leg of the commute outside the peak period on other days. Trip reduction can also mean telecommuting (working from home), either full time or on certain days of the week. Location/Design strategies encourage employees to live closer to where they work to be able to walk, bicycle or use transit.

Employer based TDM programs are typically implemented by Transportation Management Associations (TMAs), through which commuter polices and commuter services for an employment center are coordinated. Seacoast Commuter Options is a TMA based at the Pease International Tradeport, which has expanded to serve employers in the Greater Portsmouth and Dover areas. A TMA is also in development that will serve employers in Salem as part of the Salem Employment Trip Reduction Integration Program (SE-TRIP).

Recommendations

1. Continue providing technical assistance to the Seacoast Commuter Options TMA and the developing Salem TMA.
2. Work with regional and state partners to develop policies and programs encouraging employer participation in TDM programs.

4. Improving the Safety & Security of the Transportation Network

While SAFETEA-LU separated Safety and Security as planning factors that must be considered, the two concepts are inter-related

4.1 Traffic Calming

The phrase “traffic calming” refers to a set of transportation design techniques which rely on engineering, enforcement, and education in order to reduce vehicle speeds, improve safety, and improve quality of life. Rather than allowing streets to perform as conduits for high-speed vehicle travel, roadways are built so that drivers are more cognizant of non-motorized travelers. Pedestrians will then have greater, safer access to the streets. This is especially important in residential neighborhoods and central business districts where pedestrian travel is heaviest.

Traffic calming goals include:

- Creating safe and attractive streets;
- Helping to reduce the negative effects of motor vehicles on the environment;

- Promoting pedestrian, cycle and transit use;
- Incorporating the preferences and needs of the people living in or using the area; and
- Increasing quality of life.

Traffic calming objectives include:

- Achieving slow speeds for motor vehicles,
- Reducing collision frequency and severity,
- Increasing the safety and the perception of safety for non-motorized users
- Reducing the need for police enforcement,
- Enhancing the street environment (e.g., streetscaping),
- Encouraging water infiltration into the ground,
- Increasing access for all modes of transportation, and
- Reducing cut-through motor vehicle traffic.

Traffic calming measures are generally divided into two types, volume control and speed control, and many of the common techniques are shown in ***Table 4.3***. Volume control measures are used not simply to reduce volume, but more specifically, to reduce cut-through volume from motorists seeking to avoid traffic on larger arteries. Speed control measures attempt to reduce automobile speeds where they are unsafe of pedestrians, bicyclists, and those accessing transit. This is accomplished by changing the vertical (e.g. speed humps or raised medians) or horizontal (e.g. roundabouts, chicanes) alignment or narrowing the roadway. All of these measures have pros and cons concerning effectiveness, cost, maintenance, impact on emergency vehicles, and appropriateness for the specified site.

Recommendations

1. Use local and regional planning processes such as corridor studies, Safe Routes to School travel plans, and local master plan transportation chapters to promote traffic calming strategies to balance traffic movement with pedestrian and neighborhood safety.

Table 4.3: Traffic Calming Techniques

Technique	Description	Use
Speed Bumps & Speed Tables	Raised humps in road surface. Speed Tables are 8-12 feet long and comfortably crossed at 15-25 mph.	Have been shown to reduce speed and volume of traffic. Speed bumps have widespread use in parking lots, but also create hazards and plowing problems. Speed tables reduce the plowing problem by providing a more gentle slope
Rumble Strips or Changes in Roadway Surface	Patterned sections of rough pavement cause slight vibrations which cause the driver to become more alert and slow down	Can reduce accidents if properly placed. Some concerns about bike travel and increased noise.
Diagonal Diverters	Barrier placed diagonally across a four way intersection to separate it into 2 unconnected streets with each making a sharp turn.	Used in residential neighborhoods to eliminate cut-through traffic by making the route more circuitous. Best used as part of an overall plan for a neighborhood.
Dead-end Streets or Cul-de-sacs	Placing a barrier across one end of a street to eliminate motor vehicle traffic.	Used primarily in residential neighborhoods, eliminates cut-through traffic while still allowing pedestrian and bicycle access.
Semi-diverters, Neckdowns, Chicanes, Chokers & Protected Parking	Methods of restricting traffic flow without eliminating it entirely. Generally the curb is pushed out into the street at specific location(s) to create a narrowing of the roadway. Semi-diverters restrict one direction of traffic from entering a street; neckdowns and chokers reduce the width to only allow one direction of travel at a time. Chicanes extend the curb on alternating sides of the street to require vehicles to adjust their path of travel at intervals, Protected parking places curb bulb-outs at either end of parking reduce street width and reduce illegal parking.	Most of these techniques are used in residential neighborhoods to reduce the volume and speed of traffic. If sloped curbing is used, emergency vehicle movement is not blocked and snow plows can have an easier time clearing the road. Semi-diverters don't allow a vehicle to enter a street from one end, but allow two way traffic on the street itself.
Traffic Circles or Round-abouts	These are raised islands usually located at the intersection of two streets. Vehicles must go around the median to continue on the same street or to make a turn. Vehicles usually must slow to 15-25 mph to navigate them.	These work best on residential non-arterial streets where they reduce speed and accidents without diverting traffic to other streets. Can also be used on arterial and collector streets as an alternative to standard traffic signals
Stop signs, Speed Limit signs, Turn prohibition signs	Signage directs traffic to operate according to certain restrictions	Stop signs assign right-of-way, turn prohibition signs limit turning movements, and speed limit signs limit speeds (somewhat). Can be used anywhere.
One-way Streets	Discourages through traffic by eliminating travel from one direction	Used on residential streets to eliminate cut-through traffic
Traffic Signals	Properly tuned traffic signals can reduce delay on arterial streets and improve traffic flow.	Use on primary arterials. Linked and coordinated signals reduce delay, improve traffic flow and help to reduce impacts on other streets from traffic seeking alternate routes through the congested area.

4.2 Transportation Safety

Much of the work of the MPO addresses the safety of the transportation system. Examples include corridor studies which identify and address safety problems; assistance to communities in developing Safe Routes to School initiatives and other education programs and facility projects that support bicycle and pedestrian safety; and technical assistance to regional transit agencies in the development of transit safety plans.

- ***Corridor Studies:*** In recent years the RPC has conducted corridor studies for the US Route 1 corridor between Portsmouth and Seabrook, as well as the NH Route 125 corridor in Plaistow and Kingston. Beyond congestion and access management, a key element of these studies is analysis of crash data and design of safety improvements for intersections. Additional corridor studies planned for the coming biennium include Route 33 in Greenland, Route 125 in Brentwood, and Main Street (NH121A) Plaistow.
- ***Bicycle and Pedestrian Safety:*** The RPC will continue to play an active role in promoting bicycle and pedestrian safety in the region through development of local and regional bicycle and pedestrian facilities, work with communities in developing Safe Routes to School Initiatives, work at the state level to promote statewide school-based bicycle safety education, and work to promote the Complete Streets concept to support safer roadways for all travelers.
- ***Transit Safety***: Under SAFETEA-LU, a formal role for MPOs relative to transit safety and security was established, ensuring that Safety and Security issues are addressed in all aspects of planning regional transportation systems. Both COAST and CART are required to develop Safety and Security plans. COAST adopted their plan in 2003, and as of fall 2008 is working on deployment of camera systems on their buses. CART, as a new FTA recipient agency, is in process of developing its Safety and Security plan with participation from the RPC.

Motor vehicle crashes are the most prevalent safety concern in the region and in light of that safety is generally given significant consideration during the development and programming of projects for construction. The Highway Safety Improvement Program (HSIP) is a new initiative to address projects on roadway segments with higher than average crash experience and a greater likelihood of improvement will be given attention. Key types of physical safety improvements will include, but are not limited to the following examples:

- Installing and upgrading traffic control devices such as traffic signals;
- Improving facility geometrics (hills, curves, and sideslopes);
- Building auxiliary lanes for entering/departing traffic;
- Constructing hill-climbing lanes for slow-moving vehicles, especially in the mountainous area;
- Constructing pedestrian over- and underpasses;
- Installing fencing along high-activity railroad and light rail lines;
- Improving sight distances at intersections; and
- Removing fixed objects adjacent to travel ways or providing proper protection.

Also, there are a number of maintenance activities on transportation facilities that can help to preserve good safety performance. The following are key maintenance activities:

- Repainting pavement and crosswalk markings and replacing non-reflective signs;
- Removing debris along roadways, sidewalks, and multipurpose trails;

- Trimming vegetation that impacts sight distances;
- Removing snow and ice;
- Replacing non-reflective signs and maintaining other traffic control devices;
- Repairing uneven manhole covers and replacing drainage grates;
- Repairing buckled sidewalks; and
- Removing permanent (e.g. utility poles) or temporary (e.g. construction materials) obstructions on sidewalks.

Recommendations

1. Identify and track performance measures related to safety identified above under section 4.1.2.
2. Implement corridor studies for Route 33 in Greenland, Route 125 in Brentwood, Main Street (NH121A) Plaistow, and other routes as needs are identified and funding is available.
3. Continue to assist communities in the development of Safe Routes to School programs and other bicycle and pedestrian safety initiatives.
4. Assist regional transit agencies in the development and implementation of safety and security plans.

4.3 Transportation Security

Events both nationally and around the world since 2001 have focused attention on the security of the transportation network of this country and how the transportation network can be used as a weapon against us as well as hinder evacuation in the event of an emergency. Much of the work involved in preparing for and responding to these events is necessarily immediate in nature. However, there is a role for agencies involved in long term planning for how the transportation system will be prepared. There has been significant discussion nationally regarding the various roles that the MPO can take in this arena, given the current role of the agencies as intermediaries between the local communities and state and federal agencies. As shown in ***Table 4.4***, the major roles for an MPO in any stage of an incident can range from providing information and analysis and funding initiatives, to detailed response and recovery planning and monitoring. There are a number of things that the RPC can and should do to both identify and address these issues:

Recommendations

1. 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.
2. Incorporate transportation network planning into the current work with FEMA and local communities to develop hazard mitigation plans.
3. Analyze the transportation system for capacity and safety deficiencies that impact security and disaster planning concerns.
4. Incorporate security and disaster planning aspects into the project design and prioritization process.