4. Current Trends and Future Conditions

Vision and Objective

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

Basis in Projections

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

Population Projections

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

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

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

1 – Compound Annual Growth Rate (% per year)

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

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

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

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

6 – Based on American Community Survey 5-Year Estimates

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

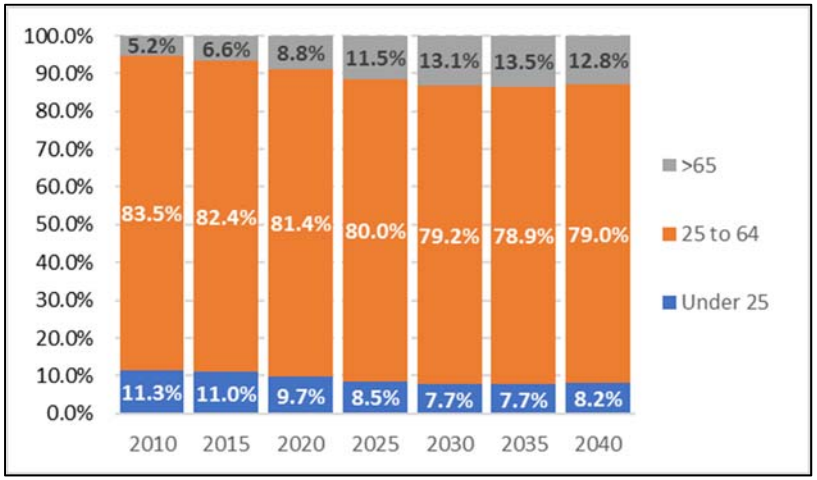
The slowing of migration, particularly of young people, into the state has brought to the forefront the issue of the aging New Hampshire population. While the state and nation as a whole are graying as the baby boom generation reaches retirement age, Rockingham County skews older than the state as a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

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

Labor Force

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

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



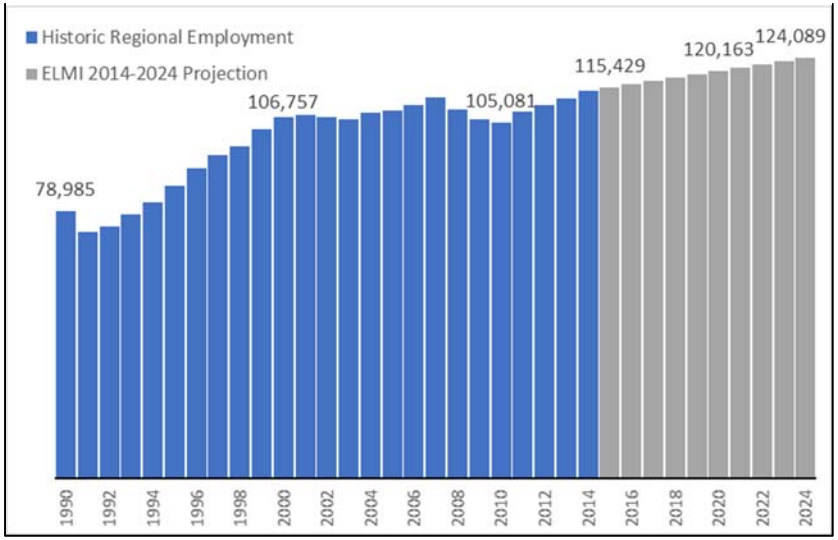
Commuting Patterns

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

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

Employment Projections

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



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

Scenario Planning

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

The scenario planning effort was based on the differences in the population growth projections produced by the New Hampshire Office of Energy and Planning and the New Hampshire Regional Planning Commissions in late 2013, and the employment projections produced by the Department of Employment

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

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

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

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

Scenario Planning Results

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

- Overall lower employment than 2010
- Smaller work force than in 2010.

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

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

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

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

Needs Assessment

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

Mobility Needs

Goal 1 - Mobility

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

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

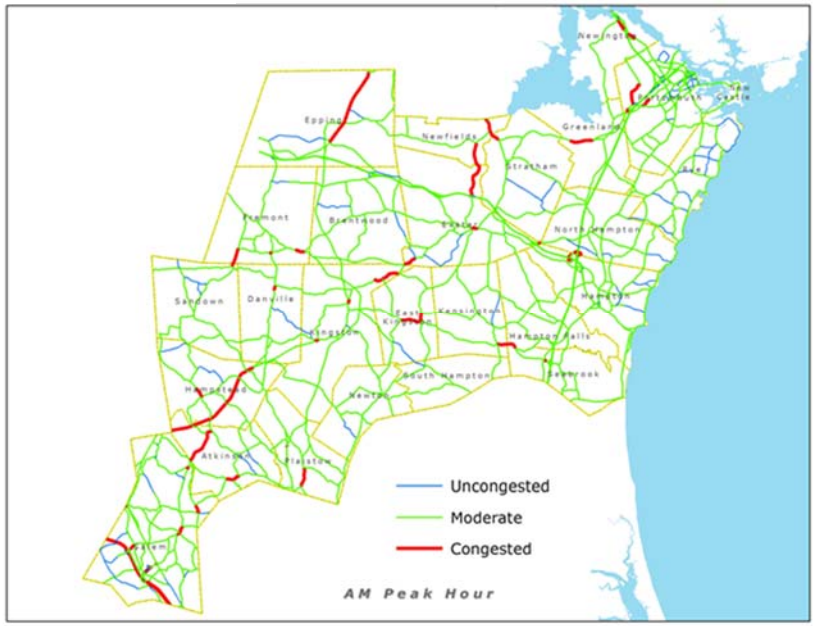
Congestion

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

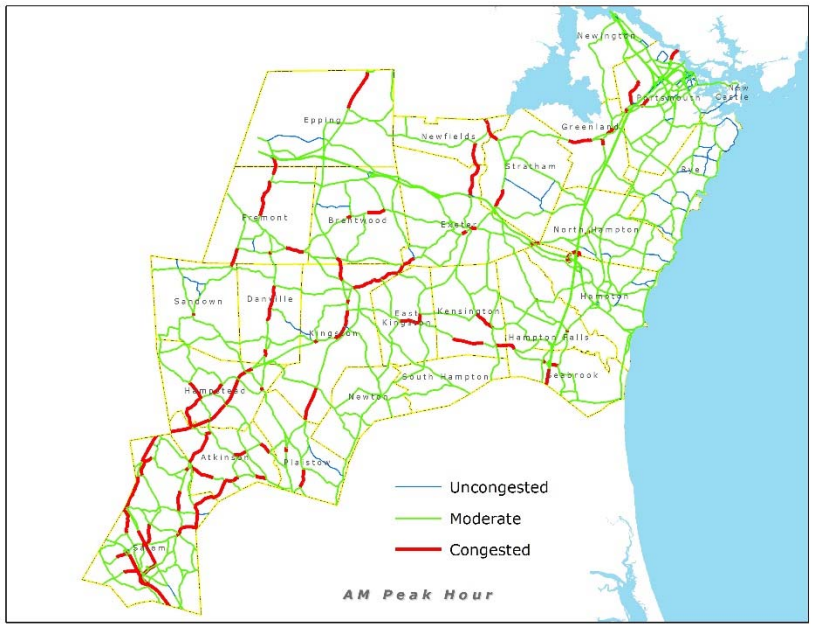
The model outputs indicate that there is substantial overlap between scenarios in terms of "congested" segments of roadway. For the most part, the roadways that are congested under one scenario are congested under all with some variance in the amount of congestion. Figure 4-5 shows the transportation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

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

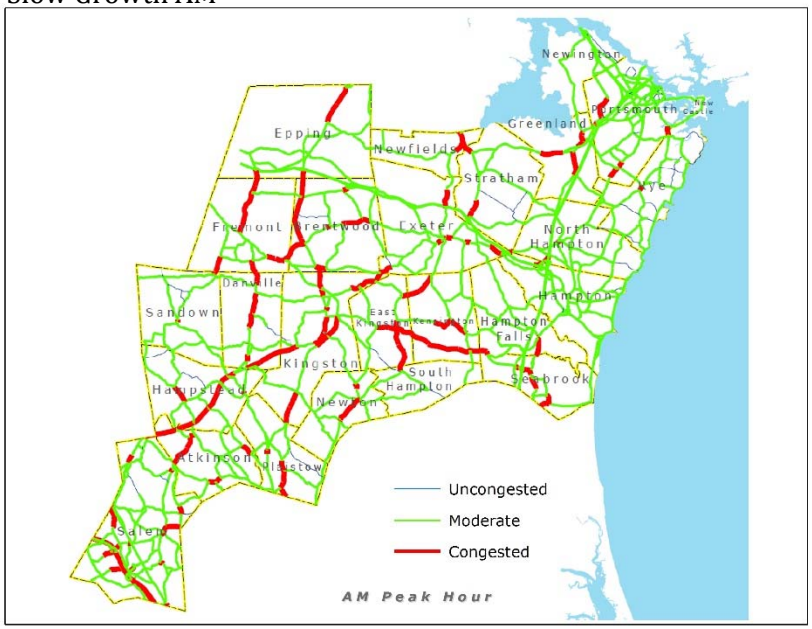
Base Year AM



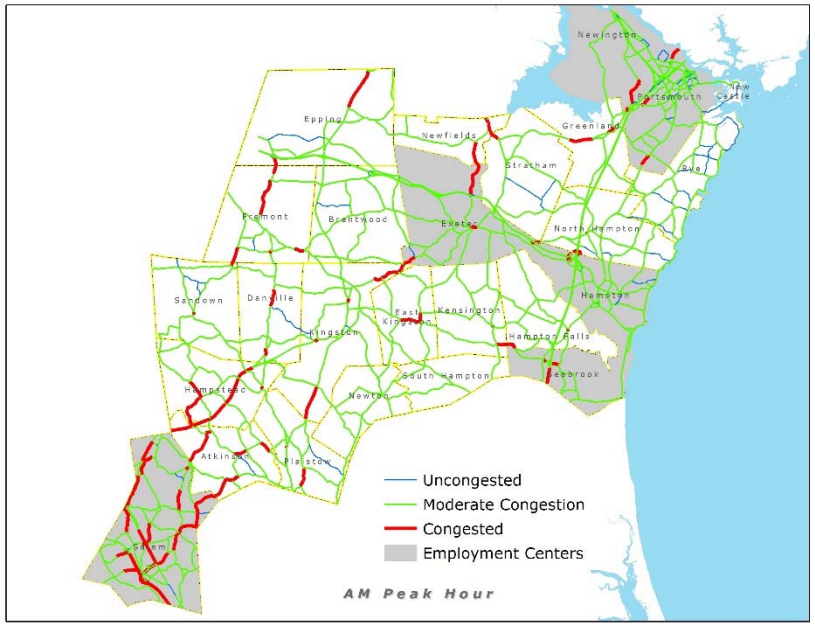
Dispersed Growth AM



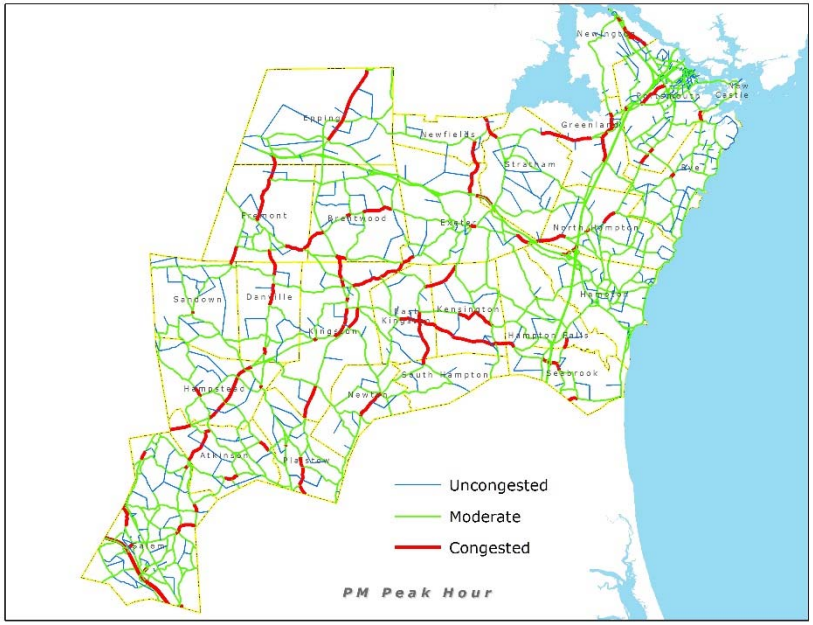
Slow Growth AM



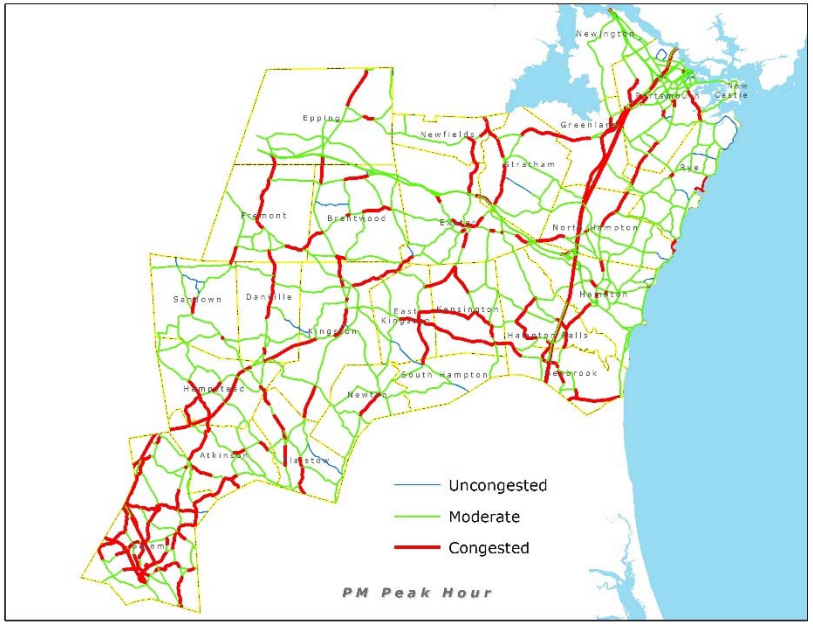
Concentrated Growth AM



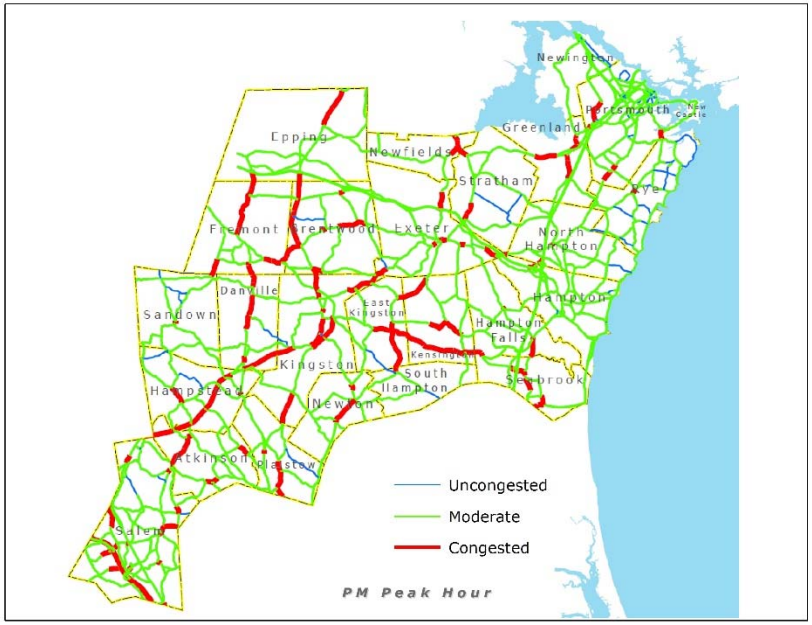
Base Year PM



Dispersed Growth PM



Slow Growth PM



Concentrated Growth PM

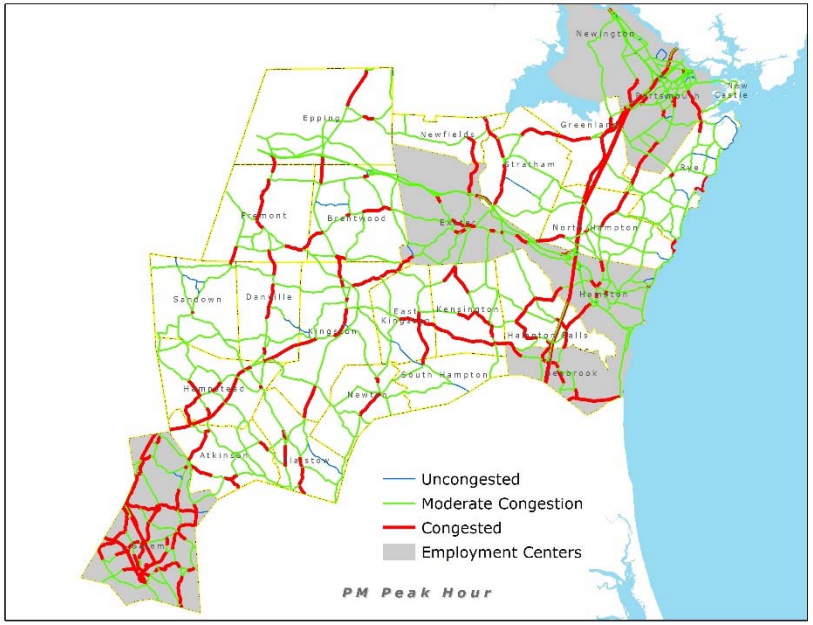


Figure 4-6 shows the baseline conditions of congestion during the AM and compares them to the 2040 condition under each of the scenarios classifying roads as "Uncongested", "Moderately Congested", or "Congested" based on the volume to capacity ratio as modeled. ***Figure 4-7*** shows the same information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

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

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

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

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

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

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

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

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

Accessibility Needs & Transportation Choice

Goal 2 – Transportation Choices

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

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

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

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

Transit

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

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

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

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

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

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

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

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

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

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

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

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

Bicycle & Pedestrian Facilities & Program Needs

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

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

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

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

  Priority off-road routes include

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

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

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

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

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

Transportation Demand Management

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

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

Shared Mobility Services

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

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

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

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

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

Autonomous Vehicles

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

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

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

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

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

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

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

Identified Needs in Shared Mobility

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

Land Use Integration Needs

Goal 3 – Land Use Integration

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

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

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

Needs of an Aging Population

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

Autonomous Vehicles & Land Use

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

System Preservation & Modernization Needs

Goal 4 – System Preservation & Modernization

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

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

Bridges & Culverts

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

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

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

Pavement Condition

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

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

Identified Needs in System Preservation and Modernization

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

Energy and Environmental Needs

Goal 5 – Energy & Environment

The region's transportation system is proactive in protecting natural and cultural resources, is energy efficient and forward looking.

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

{Insert figure depicting impervious surface coverage in RPC region}

The infrastructure that helps to move stormwater off roads, buildings and parking lots was traditionally constructed to move the water from these locations as quickly as possible and to direct them into waterways. This allows for little, if any, removal of pollutants or chance for water infiltration into the ground, and can increase the potential for erosion and flooding issues. Stormwater infrastructure is often considered forgotten infrastructure, as the cost to construct or maintain it is often incorporated into the construction and maintenance of roadways and parking lots. Retrofitting or maintain stormwater infrastructure is critical in combating water pollution. This maintenance and retrofitting will likely be expensive; NHDES has estimated the RPC region's total stormwater infrastructure costs to be almost $37 million dollars. The cost of protecting water quality through maintaining stormwater infrastructure is directly tied to the federal MS4 Stormwater Permit for municipalities. The MS4 Permit is intended to address and reduce stormwater pollution originating from municipally-owned facilities and land, including local roads. The NHDOT is require to address stormwater pollution via a similar permit.

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

Groundwater is particularly impacted by increases in land use change and imperious surfaces specifically due to the change in recharge areas for precipitation to infiltrate into the ground. Increases in development, wider. In 2008, U.S. Geological Survey (USGS) released the Seacoast New Hampshire Groundwater Availability Study, an assessment to determine the long-term

availability of groundwater in a region where groundwater is the primary source of drinking water. The overall finding, is that there are sufficient groundwater supplies to meet this growing demand in the RPC region. However, the land use and other policy decisions made at the state and municipal level could alter this scenario. Simply put, the more impervious surfaces allowed the greater the potential impact to water quality.

Wildlife, Habitat, and Open Space

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

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

Amongst RPC comminutes, several of the highest priorities identified in local master plans include protecting natural resources for water quality protection, recreation, open space, and wildlife. Currently, only 14.8 percent of land in the RPC region is permanently protected and ranges greatly from community to community.

There are a number of planning efforts that have occurred in the region and the state in recent years that can inform the transportation planning process and aid in understanding the impacts of projects on the natural environment. Several data sources for natural resources exist which can provide detailed information on the location, quality, and extent of discreet natural resource types as map "layers", such as wetlands, aquifers, forest areas by type, and soils. However, there are fewer sources which look at these resource layers in combination and assess the value of different geographical areas based on the presence, quality, and interaction of two or more of these resource layers based on their value as a functioning ecosystem. Data on cultural resources tend to be less comprehensive, as few municipalities have comprehensive and up to date historical and cultural resource inventories. Much of the cultural resource inventory data from the past 20 years has been compiled for limited geographic areas as part of regulatory requirements for permitting public infrastructure projects such as highways or utility lines.

Air Quality

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

SAFETY AND SECURITY NEEDS

Goal 6 – Safety & Security

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

Two Sources of data provide input for safety related needs in the region; the "5 Percent Report" which lists the locations in the state with the highest number of crashes, and the State Crash Records Database which provides relatively detailed information regarding the types of crashes that are occurring, who tends to be involved, and other details. In addition, the New Hampshire Strategic Highway Safety Plan provides guidance as to the areas that NHDOT and the New Hampshire Department of Safety will be focusing on to decrease the numbers surface transportation related crashes, as well as the number of fatalities and injuries from those crashes.

5% Report

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

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

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

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

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

Strategic Highway Safety Plan

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

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

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

Regional Crash Data

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

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

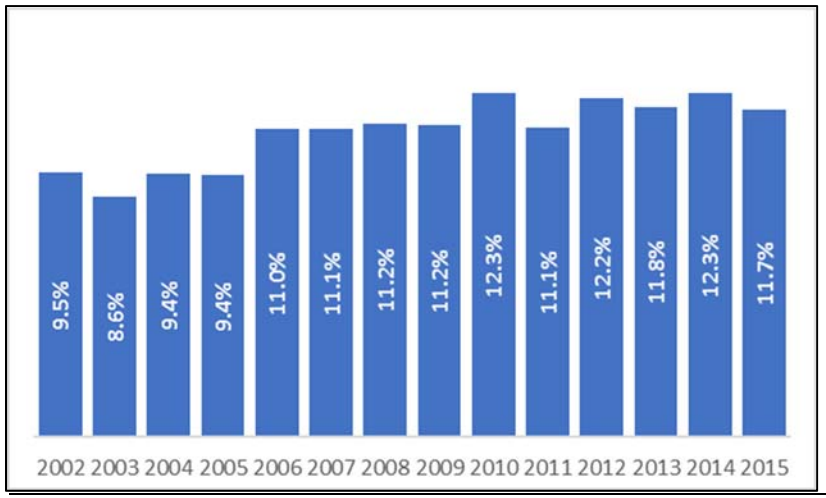
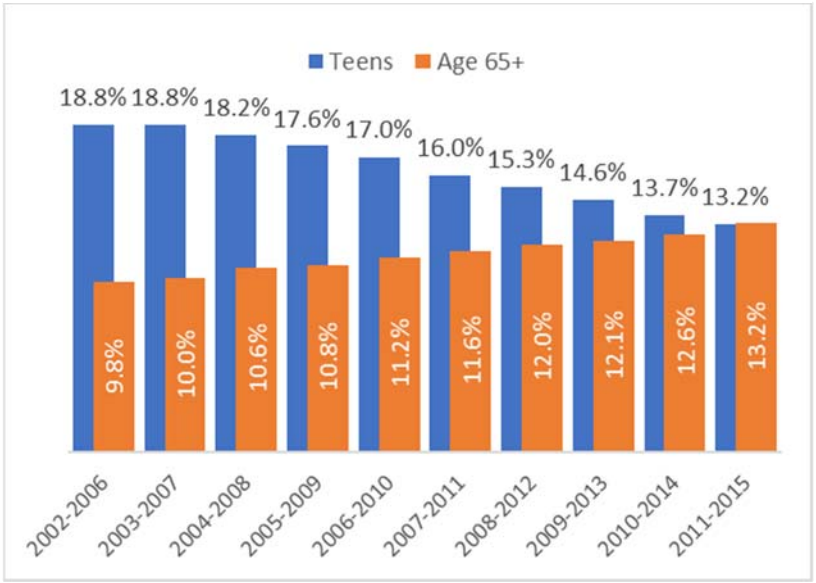


Figure 4-X: Teen and aged 65+ portion of operators involved in crashes with some causative factor (distracted driving, failure to yield, etc)



(Refer to ***Figures 3-12 to 3-16*** in Chapter 3) after many years of decreases. The five-year average fatality rate over that time period has remained steadily around 0.71 deaths per 100 Million VMT however the rate of serious injuries has declined from 26.3 per 100 Million VMT in the 2002-2006 five-year period to 19.1 per 100 Million VMT in the 2011-2015 period.

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

of handheld electronic devices while driving or temporarily halted in traffic. The percentage of motor vehicle operators involved in crashes where that was cited as a contributing factor declined in 2015, however additional data will be needed to determine if this is a continuing trend or not.

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

The number of bicycle and pedestrian related crashes is a growing concern in the region. [FORTHCOMING]

Identified Safety Needs

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

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

ECONOMIC VITALITY NEEDS

Goal 7 – Economic Vitality

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

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

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

The goals, implementation strategies and projects included here are largely consistent with the goals and objectives of the CEDS. The proposals in this plan will benefit the region's economy by providing improved mobility through currently congested areas

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

Freight

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

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

Travel & Tourism

The FAST Act gives new attention to the role of the transportation system in supporting travel and tourism by adding a new national Planning Factor focused on this area. This is particularly appropriate for the MPO region, as coastal tourism is a major driver of our economy. In State fiscal year 2014 over 36.6 million visitors came to New Hampshire and directly spent approximately $4.95 billion dollars. With secondary impacts in supply industries

and travel industry worker spending the Institute for New Hampshire Studies at Plymouth State University estimates total contribution of tourism to the state's economy at $15.2 billion. The Seacoast region generates the largest share of this revenue among the State's seven tourism regions, accounting for 15.4% of direct traveler spending or $1.064 billion dollars. (PSU/NHDTTD)

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

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

Resiliency Needs

Goal 8 – Resiliency

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

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

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

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

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

Climate Change

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

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

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

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

Accommodating Future Conditions

Sea-Level Rise: Coastal Vulnerability Assessments

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

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

Rising Groundwater

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

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

Rising Temperature

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

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

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

Spatial Variability

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

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

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

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

Additional Considerations and Resources

Site Specific Analyses

Site specific analyses and modeling is necessary to quantify these various climate change impacts. For example, modeling groundwater rise can project future hydrologic conditions but those conditions will impact transportation assets and resources in different ways and different degrees of severity based on factors such as: roadway and infrastructure location; roadway and infrastructure construction and design specifications; age of a roadway, culvert or bridge; and current condition and intensity of use of a roadway or infrastructure. Contrasting the previous example, the impacts of extreme temperature on pavement lifecycle and performance may be more uniform across a roadway system although may be influenced by

Planning and Environmental Linkages

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

Technical Resources

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

Public Health Needs

Goal 9 – Public Health

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

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

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

A public health implication of more kids being driven rather than walking or bicycle is a decline in physical activity, which has in turn contributes to significant increases in childhood obesity seen over the past three decades. According to the Center for Disease Control, in 2009 35.7% of New Hampshire adults were obese, compared to fewer than 14% in 1960. In 2009 33% of New Hampshire third graders were above a healthy weight, with 21% of boys and 15% of girls obese. The National Institute of Health has estimated the impact of weight related diseases at $147 billion annually on the U.S. healthcare system – or about 10% of all medical spending. Lost productivity for employers was estimated at an additional $3.4-$6.4 billion annually.

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

Planning Process Needs

Goal 10 – Efficient & Effective Planning Process

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

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

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

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

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

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

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

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

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

RESOURCE NEEDS

Goal 11 – Resource Availability

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

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

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

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

Funding for public transportation is a particular problem in New Hampshire. Most states provide a significant portion of the funding needed to match Federal Transit Administration (FTA) resources supporting regional public transportation. New Hampshire ranks consistently near the bottom nationally in the amount of State funding contributed to public transportation (***Table 4-X***). In 2014 the national average per capita state spending on public transportation was $47.20. Removing the influence of states with major urban rail systems, the median per capita state investment was $4.20. In comparison, New Hampshire contributed $0.51 per capita to public transportation, and most of this was in support of Intercity Bus service in the I93 corridor, or other transit services funded temporarily as mitigation for highway construction projects. Perhaps most important from a public transit operations standpoint, New Hampshire provides no regular state operating assistance to public transit agencies. The $0.24/capita shown in the table is again for services operated by COAST and UNH Wildcat Transit as mitigation for the Newington-Dover Spaulding Turnpike project. Most matching funding for COAST and CART is provided by municipalities together with on-bus advertising and interagency partnerships. This reliance on municipal match creates challenges in supporting multi-town regional transit services, where the loss of funding from one town can make a regional route unsustainable.

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

Table 4-X:
FY 2014 Per Capita State Spending on Public Transit

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

Source: AASHTO & APTA 2016