

Nashua Region Metropolitan Transportation Plan



This document provides a basic blueprint for long-term transportation investment in the Nashua Region to the horizon year 2045. The plan is structured around four major goals, developed through public outreach and coordination with advisory committees, which include Mobility and Accessibility, Quality of Life, System Sustainability and Implementation.

~ 2019 to 2045

Adopted by NRPC on Dec. 19, 2018

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

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INTRODUCTION

OVERVIEW OF THE METROPOLITAN PLANNING ORGANIZATION

The Nashua Regional Planning Commission (NRPC) region includes the City of Nashua and the towns of Amherst, Brookline, Hollis, Hudson, Litchfield, Lyndeborough, Mason, Merrimack, Milford, Mont Vernon, Pelham and Wilton. Home to more than 200,000 residents, the Nashua Region is a dynamic and thriving part of the Southern New Hampshire landscape. Situated among the rolling foothills of the Merrimack River Valley and located just 40 miles from Downtown Boston and the Atlantic Coast, the region enjoys an enviable location that provides urban amenities while retaining the quality of life benefits of rural and suburban areas.

Residents of the Nashua Region enjoy access to an extensive and well-developed transportation network which includes the FE Everett Turnpike providing direct access to Manchester, Concord and other destinations to the north as well as south to Boston, NH 101, 111, 130 and 13, US 3 and other major routes. Most residents of the region utilize private vehicles for all trip types and the region is well-oriented for this mode. Highway networks are extensive and provide convenient access to activity centers. Traffic congestion is less severe than experienced in the nearby Boston area, however traffic volumes do exceed capacity during peak hours along portions of the FE Everett Turnpike, NH 101A, the Taylor Falls Bridge between Hudson and Nashua and along other major routes. Due to the dominance of suburban development patterns, parking facilities are plentiful and low-cost throughout the region.

Pedestrian accommodations in the region are reasonably well developed in most downtown and town center areas; but are limited in rural and suburban areas. Dedicated bike and bike/pedestrian paths can be found along Nashua's rail trails, Albuquerque Ave in Litchfield, portions of Amherst other areas, however dedicated bike lanes are restricted to limited sections of recently improved roads and are not sufficiently developed in extent to form a network.

The Nashua Transit System (NTS) provides bus service throughout the City of Nashua. No fixed-route transit service is currently provided in region's other twelve communities. Notably, NTS is one of the few operators in the state to provide nighttime service. Outside of the City of Nashua, human service providers, such as Souhegan Valley Rides, help fill the gaps in service for populations in need of transit alternatives. The region also benefits from inter-city bus service including *Boston Express* which provides daily commuter service between Manchester, NH and Boston with a stop at the FE Everett Turnpike Exit 8 Park & Ride lot and limited weekly Greyhound service between Keene, NH and Boston, also with a stop at the Exit 8 Park & Ride lot. Despite its proximity to Boston, the Nashua Region has no access to passenger rail. Limited freight rail service is provided on the north-south B&M line through Nashua and Merrimack to Manchester and Concord and over an east-west line between Nashua and Wilton.

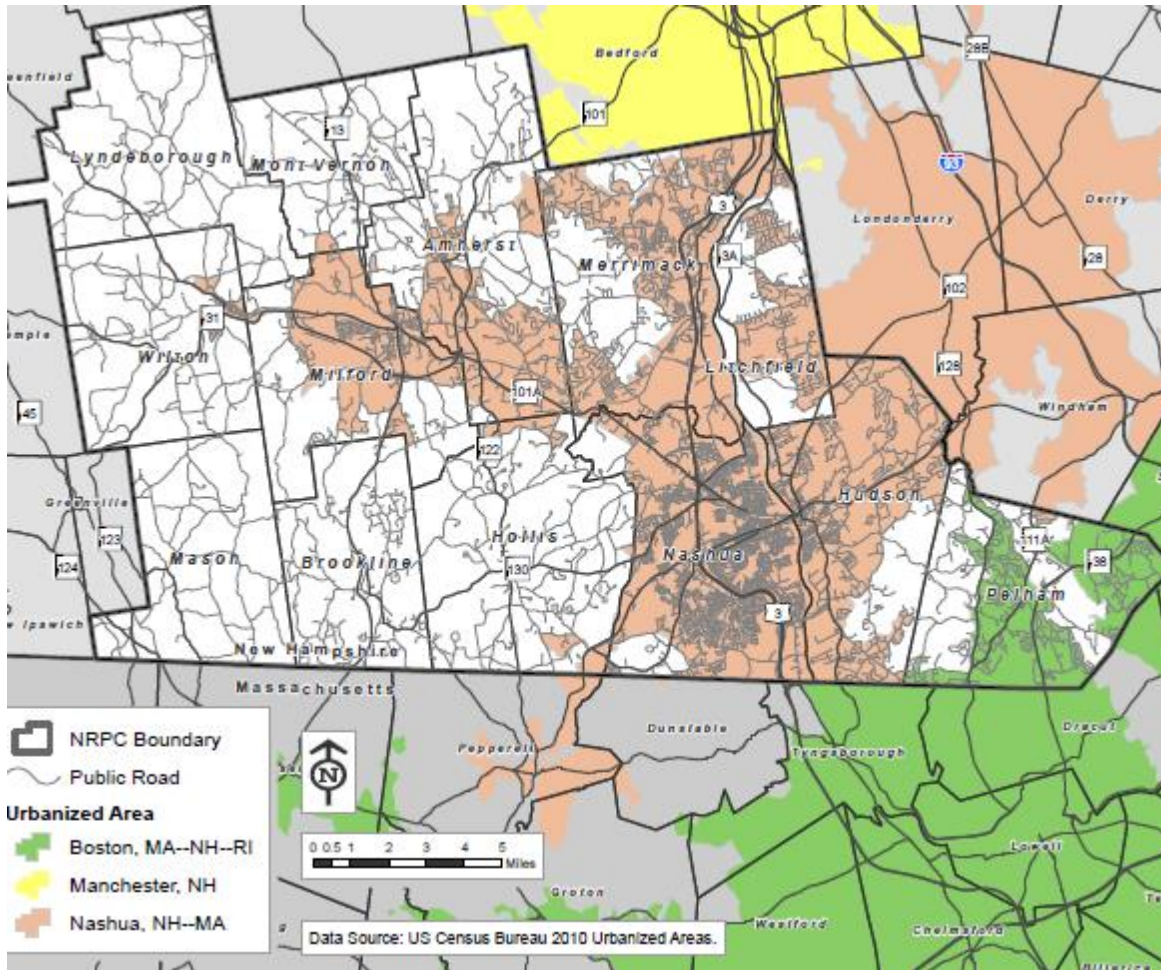
In order to meet the transportation needs of a mobile and complex society, it is necessary to have a comprehensive long-range transportation planning process that is continuous in order to adapt to changing environments and needs, cooperative in order to coordinate activities of agencies which play a role in providing transportation services at the local, state and federal levels of government and comprehensive in order to integrate various transportation models. This Continuing, Cooperative and Comprehensive (3C's) process was the original guiding principal set forward in the 1960's as the basis for development of regional transportation plans and remains an important core principle to this day.

The NRPC assumed primary responsibility for regional transportation planning in 1973, when it was designated by the Governor of New Hampshire as the Metropolitan Planning Organization (MPO) for the Nashua-Hudson Urbanized Area. The first comprehensive plan, the Nashua Area Transit Study (NATS), was produced in 1976, followed by the Nashua Mass Transit Study in 1978. There have been periodic revisions in plans through the years and substantial change in their emphasis. In 1990 a major update of NATS was conducted, which integrated highway and transit planning into a single document. A key tool developed at that time was the development of a computerized traffic forecasting model, capable of projecting changes in traffic resulting from land use evolution and improvements to the highway network. The transportation plans of the early 1990's focused on major new investment projects such as the Route 101A Bypass, the Nashua-Hudson Circumferential Highway, the Nashua Southwest Beltway and the Nashua Broad Street Parkway. Only the latter project made it to implementation. The others faced constraints on available funding and environmental challenges, although the Circumferential Highway continues as a potential project on a scaled-down basis.

An urbanized area with a population over 200,000 as defined by the Bureau of the Census is called a Transportation Management Area (TMA). As described in 49 U.S.C. 5303(k), and in recognition of the greater complexity of transportation issues in large urban areas, the Nashua MPO in the TMA has a stronger voice in setting priorities for implementing projects in the Transportation Improvement Program through "sub-allocation authority", i.e. the MPO is given authority to conduct project selection using Surface Transportation Program funds in the amount of about \$2.6 million per year. NRPC is also responsible for additional planning products, such as the maintenance of a Congestion Management Process (CMP) that identifies actions and strategies for reducing congestion and increasing mobility. The planning process for the Nashua MPO must also be certified by the Secretary of the U.S. Dept. of Transportation as being in compliance with federal requirements.

A portion of the Town of Pelham resides within the Boston Urbanized Area. While that inclusion also contributes to the sub-allocation funding total, it does not impose any additional regulatory requirements for the MPO.

Nashua and Boston Urbanized Areas



OVERVIEW OF THE METROPOLITAN TRANSPORTATION PLAN (MTP)

The Nashua MPO has the responsibility for the development and periodic update of the long-range transportation plan for the metropolitan area. NRPC is on a four-year schedule for a full update, which entails new forecasts of travel demand, evaluation of projects, receiving input through the public participation process and performing fiscal constraint analysis to ensure funding viability for the recommended improvements program. The following planning factors have been identified by the USDOT for guiding MPOs in their long-range planning process:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and nonmotorized users.

- Increase the security of the transportation system for motorized and nonmotorized users.
- Increase accessibility and mobility for people and freight.
- Protect and enhance the environment.
- Promote energy conservation.
- Improve quality of life for the community.
- Promote consistency between transportation improvements and planned State and local growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system for all modes.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
- Enhance travel and tourism.

LONG RANGE TRANSPORTATION PLAN GOALS AND OBJECTIVES

In the spring of 2012, the NRPC Transportation Technical Advisory Committee (TTAC) drafted a vision to the development of the MTP:

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

The following goals have been adopted to support this vision statement:

Mobility

1. Improve the availability of transportation options for people and goods.
2. Support travel efficiency measures and system enhancements targeted at congestion reduction and management.
3. Assure all communities are provided access to the regional transportation system and planning process.

Quality of Life

4. Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.
5. Encourage livable communities which support sustainability and economic vitality.

System Sustainability

6. Ensure adequate maintenance and enhance the safety and reliability of the existing transportation system.
7. Pursue long-term sustainable revenue sources to address regional transportation system needs.

Implementation

8. Provide for timely project planning and implementation.
9. Develop cost-effective projects and programs aimed at reducing the costs associated with constructing, operating, and maintaining the regional transportation system.

The following objectives are established with the purpose of supporting the vision and goals of this MTP:

1. The future highway network should establish shorter routes to cross natural boundaries, **relieve traffic congestion**, and create a logical progression in increasing the connectivity of the existing road network. The road network should provide for the **most efficient circulation of vehicles**. Response time for fire apparatus and emergency vehicles at the local and regional level should be reduced through improvements in the road network. The expansion of the road network should be achieved in ways that limit impacts to neighborhood cohesiveness, conserve open space (including woodlands and wetlands), and **encourage pedestrian and bicycle travel**. Consideration should be given to lessen the impact of secondary growth due to new highways, which in turn can lead to the re-emergence of traffic congestion.
2. Promote transportation demand management practices and the development of a transportation management association to **relieve traffic congestion and increase circulation and efficiency in the existing highway network**.
3. Encourage the use of access management techniques in commercial highway corridors to **preserve capacity**, increase safety, and improve the aesthetic environment. Support and encourage the redesign of areas and highway corridors that have experienced strip mall development so that they can **better accommodate bicycle, pedestrian, and transit use**.
4. Encourage transportation improvements in urban centers and town centers away from the urban fringe to **improve transportation efficiency. Improve convenience and service, and therefore the ridership, of the transit system** through the targeting of segments of the market that are not currently part of Citybus patronage. Promote the **extension of transit service** to urbanized areas in the towns and the **expansion of sidewalk and pedestrian facilities** in town centers.
5. Encourage multi-modal use and the integration of alternative modes, coordinated with land use and zoning practices **that reduce dependency on the automobile and encourage pedestrian oriented and transit-oriented development**.
6. Encourage local planning that supports an efficient and cost-effective transportation system including the development of site review regulations that encourage access management techniques and the **inter-connection between sites and the accommodation of cars, bicycles, and pedestrians**.
7. Establish inter-city transit connections including **passenger rail service**.
8. Promote access to transportation for the under-served and include plans and projects that **ensure that the needs of transit users, bicyclists, and pedestrians are met**. Promote plans and projects that link the jobless with jobs on a regional level.

Improve the safety and quality of life in low-income areas and minority neighborhoods by **reducing traffic congestion and implementing traffic calming techniques**.

9. Encourage public/private sector partnerships and private sector participation in the financing of transportation projects and services. Establish a transportation system that provides for orderly economic growth while preserving the environmental and cultural resources of the region.

PLANNING EMPHASIS AREAS

PERFORMANCE-BASED PLANNING

The Federal transportation act passed in 2012, Moving Ahead for Progress in the 21st Century Act (MAP-21), mandated that all MPOs and state DOTs use performance measures to work toward specific goals and targets. In 2015 the Fixing America's Surface Transportation (FAST) act was passed to replace MAP-21, which provides additional guidance for performance-based planning. There are now seven national performance goals to be tracked by states and MPOs. The four MPOs of New Hampshire formed a Partnering for Performance New Hampshire (PFPNH) group and have met monthly since 2016, coordinating with the State of New Hampshire to identify specific performance measures and targets.

The following seven national performance goals set forward by FHWA are to be tracked by states and MPOs (23 CFR 490) apply to the National Highway System (NHS); however, NRPC seeks to apply standards to all public roadways in the region.

- Safety – Achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- Infrastructure Condition – Maintain pavements and bridges in a good state of repair.
- Congestion – Achieve a significant reduction in recurring travel delay on the National Highway System.
- System Reliability – Improve the efficiency of the surface transportation system.
- Freight Movement and Economic Viability – Improve the national freight network, strengthen the ability of rural communities to access national and international trade markets and support regional economic development.
- Environmental Sustainability – Enhance the performance of the transportation system, while protecting and enhancing the natural environment.
- Reduced Project Delivery Delays – Reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The Federal Transit Administration added the following two performance measures applicable to public transit operators receiving federal financial assistance.

- Transit Asset Management Plan – Promote the creation of strategic and systematic processes of operating, maintaining and improving public transportation capital assets effectively through their life cycle.
- Public Transportation Agency Safety Plan – Promote the development of safety plans to ensure that public transportation systems are safe.

The following sections described those performance targets which have been addressed by the NHDOT and MPOs per deadlines established by the USDOT.

TRANSIT ASSET MANAGEMENT

The Federal Transit Administration describes transit asset management (TAM) as a business model that prioritizes funding based on the condition of transit assets to achieve or maintain transit networks in a state of good repair. It involves a set of strategic and systematic processes and practices for managing the performance, risks, and costs of transit assets over their entire lifecycle for providing safe, cost-effective, and reliable public transportation. Through asset management, transit agencies can more effectively use available funds to improve the physical condition and performance of their system. This, in turn, may result in increased ridership.

The NTS TAM Plan contains the following elements:

- **Asset Portfolio:** An inventory of the type and number of capital assets (rolling stock, equipment and facilities) owned, operated and/or maintained by NTS that support the delivery of public transportation services. (Exception: Equipment with an acquisition value under \$50,000 that is not a service vehicle.)
- **Asset Condition Assessment:** A process of inspecting, evaluating and reporting the visual and/or measured condition of NTS' inventoried assets.
- **Management Approach:** The strategies, requirements, processes and activities needed over the course of the life of the assets, from design/procurement, operation, maintenance, and rehabilitation to replacement and disposal.
- **Work Plans and Schedules:** The prioritized investments or projects needed to maintain a state of good repair or to enhance the condition and performance of NTS' assets.

NTS has established specific, measurable, achievable, realistic and time-bound (SMART) goals.

TAM Goals	TAM Objectives
Maintain a state of good repair for the NTS Fleet	Update the Fleet Maintenance Plan every 4 years, concurrent with the TAM Plan.
	Review transit needs for inclusion in the City of Nashua's Capital Equipment Reserve Fund (CERF) annually by July to ensure that required improvements are included in September submittal
	Apply for all applicable grants to provide the Federal match for additional Rolling Stock purchases (ongoing)
Maintain a state of good repair for facilities and equipment	Update the Facilities and Equipment Maintenance Plan 4 years.
	Review transit needs for inclusion in the City of Nashua's CERF (for equipment) and/or Capital Improvement Program (for facilities) annually by July to ensure that required improvements are included in September submittal

Improve Customer Satisfaction	Educate the public about new fixed route and para-transit fleet replacements, through public meetings, social media and educational materials (ongoing)
	Conduct annual rider surveys to assess customer satisfaction and use feedback as a basis for future projects that enhance the user experience.

TAM TARGETS

The Federal Transit Administration (FTA) [Final Rule on Transit Asset Management \(49 CFR Part 625\)](#). The rule required targets for transit assets to be developed by January 1, 2017 for the following fiscal year. The targets deal with four broad areas of asset categories: Rolling Stock, Equipment, Infrastructure, and Facilities. NTS is not required to set targets for infrastructure as that requirement pertains only to fixed-guideway/rail systems, which NTS does not operate.

The table below details the initial TAM target for 2018 set in December 2016, in accordance with the final rule and the new target for 2019. NTS set targets for rolling stock and equipment based upon the anticipated number of assets in each class that will have met or exceeded the Useful Life Benchmark (ULBs) on October 1, 2018 divided by the anticipated number of assets in each class for the target years. The ULBs for rolling stock are based on guidance from the FTA, with adjustments made based on NTS records and experience. Baseline conditions were calculated based upon the number of assets in each class that met or exceeded the ULB on October 1, 2017. ULBs for equipment are derived from the minimums documented in [FTA Circular 5010.1E](#) and are also adjusted based on historical records. Targets for facilities are developed by applying the FTA's Transit Economic Requirements Model (TERM) scale to facilities used in the provision of public transportation. The TERM scale is a 5-point scale ranging from poor condition (1.0) to excellent condition (5.0). The performance measure is the number of facilities with an overall condition below a 3.0, which means adequate.

The NTS TAM Plan covers a horizon period from July 1, 2018 through June 30, 2022, and will be updated every two years, coincident with the updates to the Nashua MPO TIP and the NHDOT STIP. The TAM Plan will be amended during the four-year horizon period when there is a significant change to the NTS asset inventory, condition assessments, or investment prioritization that were not reasonably anticipated during the development of the Plan.

The Nashua MPO adopted the 2019 targets at its meeting of October 2018.

The condition of NTS capital assets are summarized in the tables on the following pages.

<div> <div>NASHUA TRANSIT SYSTEM</div> <div>Transit Asset Management Plan</div> </div>									
Asset Category	2017 Baseline			2018 Target			2019 Target		
	Assets > ULB 10/1/17			Assets > ULB 10/1/18			Assets > ULB 10/1/19		
Revenue Vehicles	Total	> ULB	%> ULB	Total	> ULB	%> ULB	Total	> ULB	%> ULB
Transit Buses	9	8	89%	10	1	10%	12	1	8%
Trolleys	3	3	100%	3	3	100%	1	1	100%
Paratransit Vans	9	9	100%	9	3	33%	9	0	0%
Equipment	Total	> ULB	%> ULB	Total	> ULB	%> ULB	Total	> ULB	%>ULB
Non-Rev/Service Veh.	2	1	50%	2	1	50%	2	1	50%
Trucks/other Vehicles	4	2	50%	4	2	50%	4	0	0%
Facilities	Total	> 3.0	% > 3.0	Total	> 3.0	% >3.0	Total	> 3.0	% >3.0
Administrative Offices	1	0	0%	1	0	0%	1	0	0%
Passenger Facility	1	0	0%	1	0	0%	1	0	0%
Maintenance Garage	1	0	0%	1	0	0%	1	0	0%

Asset Category	Total	% > ULB	Ave. Condition
Rolling Stock	22	31.8%	4.2
Transit Buses	10	10.0%	4.5
Trolleys	3	100.0%	3.7
Paratransit Vans	9	33.3%	3.9
Equipment	6	50.0%	4.1
Non-Revenue Service Vehicles	2	50.0%	5.0
Trucks & Other Rubber Tire Veh.	4	50.0%	3.9
Non-Veh. Equipment >= \$50,000	2	NA	4.1
Facilities	3	0.0%	4.7
Administrative Offices	1	0.0%	4.7
Passenger Facility	1	0.0%	4.7
Maintenance Garage	1	0.0%	4.7

SAFETY

The FHWA published a final rule in March 2016 pertaining to the Highway Safety Improvement Program (HSIP) requiring targets for Safety Performance which include the following measures:

1. **Number of Fatalities:** The total number of persons suffering fatal injuries in a motor vehicle crash during a calendar year.
2. **Rate of Fatalities:** The ratio of total number of fatalities to the number of vehicle miles traveled (VMT, in 100 Million VMT) in a calendar year.
3. **Number of Serious Injuries:** The total number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year.
4. **Rate of Serious Injuries:** The ratio of total number of serious injuries to the number of VMT (in 100 Million VMT) in a calendar year.
5. **Number of Non-Motorized Fatalities and Non-motorized Serious Injuries:** The combined total number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year.

Data for the establishment of these measures is provided from three sources:

- **Fatality Analysis Reporting System (FARS):** FARS Annual Report File or Final data is utilized to provide information on fatal crashes in the state.
- **State Motor Vehicle Crash Database:** Data collected and maintained by the NH Department of Safety is utilized to determine the number of serious injury crashes in the state (currently those classified as “A” on the KABCO scale). Crashes can be aggregated at the state, region, community, or highway level.
- **Highway Performance Monitoring System (HPMS):** State Vehicle Miles of Travel (VMT) data is collected by the Department of Transportation and aggregated into a dataset for the state. VMT data can be calculated for MPO regions and individual communities.

Target Development

States establish Highway Safety Improvement Program (HSIP) targets and report them for the upcoming calendar year in the HSIP annual report that is submitted to FHWA by August 31st each year. Targets are applicable to all public roads, regardless of functional classification or ownership. The targets established for number and rate of fatalities, and number of serious injuries must be identical to those established for the National Highway Transportation Safety Agency (NHTSA) Highway Safety Grant program in the annual Highway Safety Plan. The state has the option to also establish any number of urbanized area targets and a non-urbanized area target for the purposes of evaluating and reporting measures however those sub-state targets are not included in the significant progress determination that will be made by FHWA.

In New Hampshire, the process used to develop the required safety measures included in the annual Highway Safety Plan formed the basis for the establishment of the five FHWA mandated targets by NHDOT and the MPOs. This involved coordination and consultation between the New Hampshire Departments of Transportation and Safety, as well the four MPOs in the state. Currently available fatality, serious injury, and volume data were analyzed to establish 2007-2016 conditions in terms of total fatalities, fatality rates, total serious injuries, serious

injury rates, as well as total non-motorized fatalities and serious injuries. Five-year rolling averages were developed from these values and utilized to compute projected values for 2018.






Target Adoption

The Nashua MPO has voted to support the State of New Hampshire HSIP Targets in all five mandated areas for the initial performance period. In doing so, the MPO is agrees to:

- Work with the State and safety stakeholders to address areas of concern for fatalities or serious injuries within the metropolitan planning area
- Coordinate with the State and include the safety performance measures and HSIP targets for all public roads in the metropolitan area in the MTP (Metropolitan Transportation Plan)
- Integrate into the metropolitan transportation planning process, the safety goals, objectives, performance measures and targets described in other State safety transportation plans and processes such as applicable portions of the HSIP, including the SHSP
- Include a description in the TIP (Transportation Improvement Program) of the anticipated effect of the TIP toward achieving HSIP targets in the MTP, linking investment priorities in the TIP to those safety targets

State Target Summary

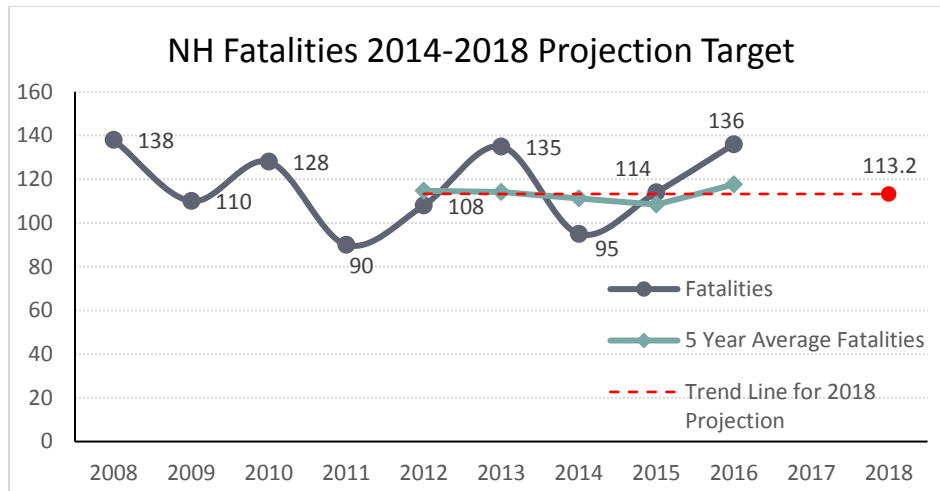
The following tables show the data supporting the targets for the five required measures as well as a graph showing the state targets for 2018. These data and targets will be continuously updated.

Measure	5-Year Average		One-Year Trend	Target (2014-2018)
	Previous	Current		
	(2011-2015)	(2012-2016)		
Number of Fatalities	108.4	117.6		113.2
Fatality Rate per 100 Million VMT	0.839	0.900		0.866
Number of Serious Injuries	496.8	499.8		499.8
Serious Injury Rate per 100 Million VMT	3.847	3.828		3.847
Non-Motorized Fatalities and Serious Injuries	56.4	58.8		51.4

State Target Detail and MPO Comparison

Number of Fatalities

The Federal Fatal Analysis Reporting System (FARS) provides the data necessary for identifying the total number of traffic crash fatalities in New Hampshire and for the MPO region. Five-year rolling averages are computed to provide a better understanding of the overall data over time without discarding years with significant increases or decreases, as well as to provide a mechanism for regression to the mean for a random variable such as fatalities.

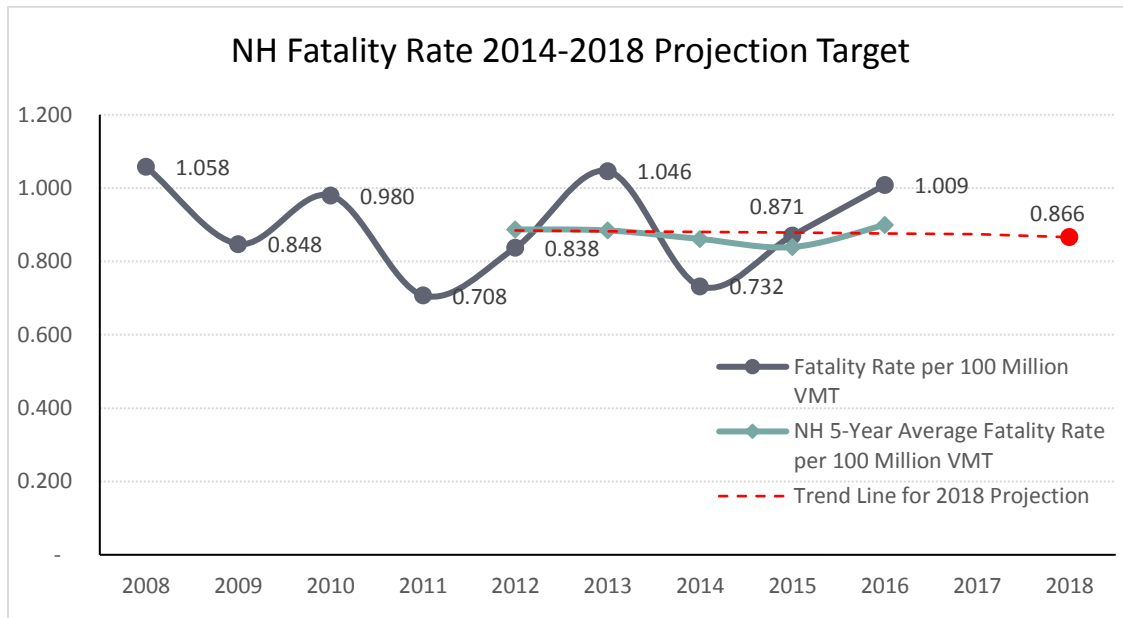


Fatalities: Statewide and NRPC Region, 2008 - 2016

Year	State of NH		NRPC Region	
	Fatalities	5-yr Ave	Fatalities	5-yr Ave
2008	138		13	
2009	110		4	
2010	128		13	
2011	90		9	
2012	108	114.8	12	10.2
2013	135	114.2	16	10.8
2014	95	111.2	13	12.6
2015	114	108.4	12	12.4
2016	136	117.6	10	12.6

Rate of Fatalities

The Federal Fatal Analysis Reporting System (FARS) maintained by the National Highway Traffic Safety Administration (NHTSA) provides the data necessary for identifying the total number of traffic crash fatalities in New Hampshire and the MPO region specifically. This information is combined with data from the Highway Performance Monitoring System (HPMS) which provides annual Vehicle Miles of Travel (VMT) at the State and community level. Combining the total number of fatalities in a particular year with the aggregated volume of travel in the state during that same year provides a fatality rate per 100 Million VMT. This data is further aggregated into 5-year averages to reduce the impacts of the high variability in the number of fatalities from year to year and to provide some indicators of longer-term trends.

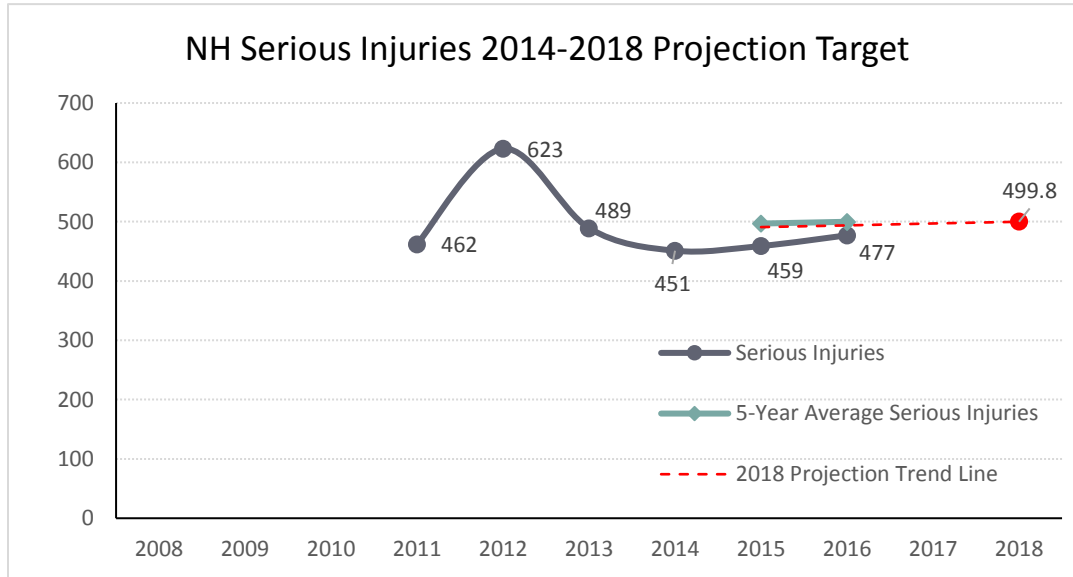


Rate of Fatalities Per 100 Million VMT: Statewide and NRPC Region, 2008 - 2016

Year	State of NH		NRPC Region	
	Fatality Rate	5-yr Ave	Fatality Rate	5-yr Ave
2008	1.058		0.804	
2009	0.848		0.249	
2010	0.980		0.802	
2011	0.708		0.571	
2012	0.838	0.887	0.751	0.689
2013	1.046	0.884	1	0.635
2014	0.732	0.861	0.808	0.675
2015	0.871	0.839	0.739	0.786
2016	1.009	0.900	0.598	0.774

Number of Serious Injuries

Serious injuries are defined currently as those that are designated as “A” or “4 Incapacitating” on the crash report form used by the New Hampshire Department of Safety (State of New Hampshire Uniform Police Traffic Crash Report, 2007). This includes injuries that involve severe lacerations, broke or distorted limbs, skull fracture, crushed chest, internal injuries, unconscious when taken from the accident scene, or unable to leave the accident scene without assistance. The State Crash Records database maintained by the New Hampshire Department of Safety provides the data necessary for identifying the total number of serious injuries from traffic crashes in New Hampshire and the MPO region specifically. Data can be analyzed at the state, regional, municipal, or corridor level.

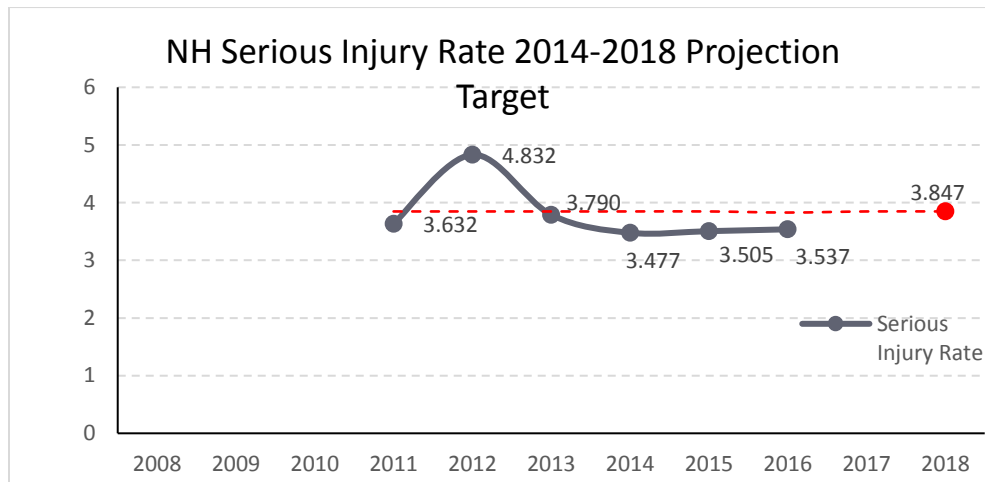


Serious Injuries: Statewide and NRPC Region, 2011 - 2016

Year	State of NH		NRPC Region	
	Serious Injuries	5-yr Ave	Serious Injuries	5-yr Ave
2011	462		99	
2012	623		90	
2013	489		78	
2014	451		61	
2015	459	496.8	76	80.8
2016	477	499.8	103	81.6

Rate of Serious Injuries

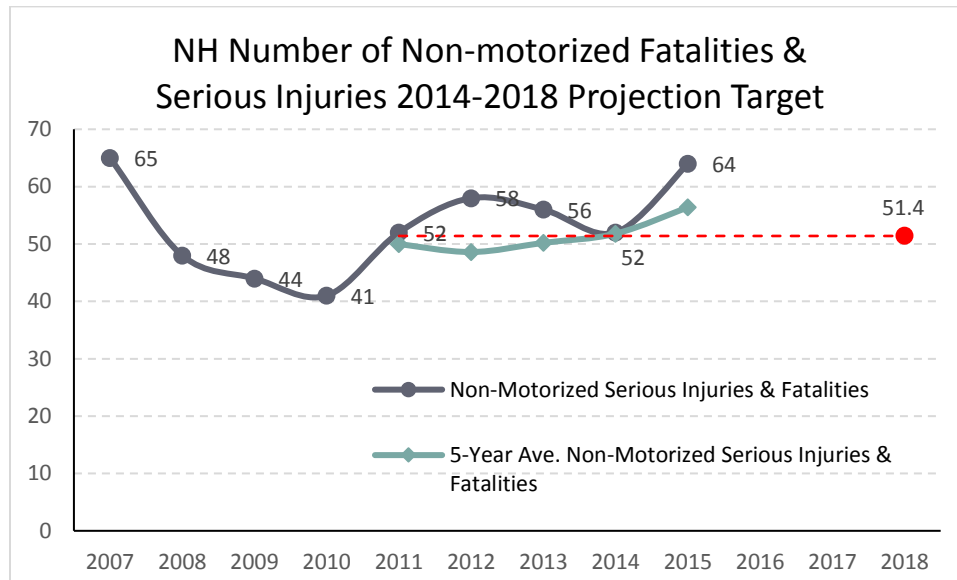
The Rate of Serious Injuries is calculated by applying an estimate of annual travel in the state to the serious injury totals for the same year. The State Crash Records database maintained by the New Hampshire Department of Safety provides the data necessary for identifying the total number of serious injuries from traffic crashes in New Hampshire and the MPO region specifically. This information is combined with data from the Highway Performance Monitoring System (HPMS) which provides annual Vehicle Miles of Travel (VMT) at the State and community level to produce a rate of serious injuries per 100 Million VMT. This value is further aggregated into five-year averages to identify longer-term trends and reduce the impacts of the variability of the data.



Year	State of NH		NRPC Region	
	Rate of Serious Injuries	5-year Average	Rate of Serious Injuries	5-year Average
2011	3.632		6.277	
2012	4.832		5.629	
2013	3.790		4.875	
2014	3.477		3.793	
2015	3.505	3.847	4.681	5.051
2016	3.537	3.828	6.164	5.028

Number of Non-Motorized Fatalities and Serious Injuries

This performance measure utilizes data from both NHTSA's FARS database and the State Crash Records Database which is maintained by the New Hampshire Department of Safety. Each dataset is queried for non-motorized vehicle crashes and the results are tabulated below. This data can be analyzed at the state, regional, municipal, or corridor level.



Year	State of NH		NRPC Region	
	Non-Motorized Fatalities & Serious Injuries	5-year Average	Non-Motorized Fatalities & Serious Injuries	5-year Average
2007	65		12	
2008	48		4	
2009	44		5	
2010	41		5	
2011	52	50.0	8	6.8
2012	58	48.6	9	6.2
2013	56	50.2	9	7.2
2014	52	51.8	7	7.6
2015	64	56.4	10	8.6

Crash Modification Factors for Projects Impact Analysis

Crash modification factors (CMF) have been developed through research conducted by FHWA to compute the expected reductions in accidents and accident severity after implementing a countermeasure at a specific location. It is defined as the ratio of expected crash frequency with improvement over that without improvement. A CMF ratio less than one indicates an expected reduction in crashes or crash type as a result of the proposed action; greater than one indicates an increase. There are instances where the CMF projects an increase in total accidents but reduction in injury accidents. An example might be traffic signalization, which might increase minor rear-end collisions but reduce serious high-speed crashes through a previously stop-controlled intersection.

PAVEMENT AND BRIDGE CONDITION

The NHDOT developed targets for NHS pavement conditions based on the International Roughness Index (IRI), which is a measure which does not include specific distresses such as rutting and cracking. The IRI measures the vertical movement, or bumpiness, that occurs along a route. It is a good barometer because it registers what type of ride the driver is experiencing. The FHWA has established an IRI threshold of 95 or less for categorizing road quality as "good" and between 95 and 170 as "acceptable". IRI scores exceeding 170 are indicative of pavement distress conditions that warrant rehabilitation or reconstruction of pavement. NHDOT may apply the IRI measure for only its first round of performance targets. In the future the more complex Highway Performance Monitoring System (HPMS) must be used both by the State and MPOs.

The NHDOT Pavement IRI data have shown an upward trend in percent good condition on the non-interstate NHS (the relevant measure for the NRPC area), from 67.0% in 2012 to 70.1% in 2016. NHS mileage in poor condition has varied from a low of 6.9% in 2012 to 11.7% in 2014 and now comprises 9.8% of statewide mileage. The NHDOT has selected future targets of 65% good and 12% poor. For bridges the NHDOT has set targets which match data collected for existing conditions: 57% good and 7% poor. There has been very little variability in bridge condition data statewide over the 2014-2018 period. **The Nashua MPO has voted to support the NHDOT pavement IRI targets and bridge targets for our region.**

NHDOT Baseline Conditions and Targets for Pavement and Bridges

<u>IRI Targets</u>		<u>Baseline Conditions</u>	<u>2-Year Target</u>	<u>4-Year Target</u>
Pavement Condition	Non-Interstate NHS: Good	70.1%	65.0%	65.0%
	Non-Interstate NHS: Poor	9.8%	12.0%	12.0%
Bridge Condition	NHS: Good	57.0%	57.0%	57.0%
	NHS: Poor	7.0%	7.0%	7.0%

As noted, both the State and MPOs will be required to use the more comprehensive HPMS measure in future target setting. For this reason, NRPC is developing HPMS pavement targets in addition to the adopted IRI targets. The table below shows that the HPMS data produces different results from the IRI.

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NHS roadways score 50% good and 4.5% poor compared with the statewide measures of 44.3% and 2.7% respectively. **The Nashua MPO adopted HPMS targets of 50% Good and 5% Poor to supplement the adopted IRI targets.**

HPMS PAVEMENT DATA MANDATED FOR MPO PM2

Non-Interstate NHS - NHDOT

	<u>2015 mi.</u>	<u>2015%</u>	<u>2016 mi.</u>	<u>2016%</u>	<u>2017 mi.</u>	<u>2017%</u>
Fair	1,331	78%	1,225	71%	1,014	53%
Good	372	22%	472	27%	849	44%
Poor	13	1%	25	1%	52	3%
Total	1,716		1,722		1,915	

Non-Interstate NHS - NRPC

	<u>2015 mi.</u>	<u>2015%</u>	<u>2016 mi.</u>	<u>2016%</u>	<u>2017 mi.</u>	<u>2017%</u>
Fair	162	74%	140	63%	124	46%
Good	55	25%	74	33%	136	50%
Poor	3	1%	8	4%	12	4%
Total	220		222		272	

As noted, the Nashua MPO adopted the NHDOT statewide targets of 57% good and 7% poor, as the data did not vary significantly between the two methodologies. It is worth noting that the bridges in the NRPC score significantly better than the statewide results.

Bridges - NHDOT

Square feet in 1000's

	<u>2015 sf</u>	<u>2015%</u>	<u>2016 sf</u>	<u>2016%</u>	<u>2017 sf</u>	<u>2017%</u>
Fair	2,412.8	35%	2,392.7	35%	2,485.9	36%
Good	4,056.0	59%	3,981.3	57%	3,975.6	57%
Poor	424.6	6%	556.4	8%	498.2	7%
Total	6,893.4		6,930.4		6,959.7	

Bridges - NRPC

	<u>2015 sf</u>	<u>2015%</u>	<u>2016 sf</u>	<u>2016%</u>	<u>2017 sf</u>	<u>2017%</u>
Fair	93.7	15%	85.2	14%	81.9	13%
Good	521.8	85%	521.3	85%	521.3	85%
Poor	0.0	0%	8.5	1%	11.8	2%
Total	615.5		615.0		615.0	

TRAVEL TIME RELIABILITY

For the Travel Time Reliability Performance Measure, there is a uniform measure defined as the ratio of the 80th percentile travel time to the 50th percentile. A ratio not exceeding 1.5 is defined as constituting "reliability". The statewide Level of Travel Time Reliability (LOTTR) of 88% was identified in the Statewide Performance Report and a recent data analysis indicates reliability has exceeded 90% in the past two years. The State has selected a target of 85%-person miles on the NHS being reliable. In the NRPC region, LOTTR has exceeded 92% in each of the past two years. **The Nashua MPO has formally adopted the statewide 85% target for the travel time reliability target.**



2019 – 2045 Metropolitan Transportation Plan
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ENVIRONMENT AND AIR QUALITY

AIR QUALITY

The transportation sector impacts the natural environment in several ways, most prominently through greenhouse gas emissions associated with motorized transport, the loss of open space as a direct and indirect consequence of transportation investments, and stormwater impairments due to impervious surface cover. The transportation sector is the most significant source of carbon emissions in New Hampshire, accounting for 43 percent of all such emissions in 2010. A significant source of transportation emissions is associated with personal automobile use.

National Ambient Air Quality Standards

The United States Clean Air Act, last amended in 1990, requires the Environmental Protection Agency to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health. The EPA currently sets standards for six different pollutants including carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution, and sulfur dioxide. Currently, the Nashua Region and all of New Hampshire meet EPA standards for all transportation-related emissions regulated under the NAAQS and are therefore classified as attainment areas.

New Hampshire Ozone Status

For nearly 20 years, New Hampshire has been working to improve the quality of the air with the focus being to reduce the amount of ozone that forms during the summer months. The Nashua Regional Planning Commission in its role as the Metropolitan Planning Organization has partnered with NHDOT and NHDES to reduce mobile source emissions and meet the Ozone standards set by the Environmental Protection Agency (EPA). Over the last two decades two Ozone standards have been in effect in New Hampshire; the 1997 standard of 80 parts per billion (ppb) and the more stringent 2008 standard of 75 ppb. Both are based on measurements over an 8-hour period.

Portions of New Hampshire did not meet the 1997 80 ppb standard when it was issued so they were designated as “non-attainment”. As required by the Clean Air Act (CAA), NRPC worked to identify transportation projects that would reduce congestion and support non-motorized mode of transportation. These efforts, combined with federal programs such as federal vehicle emission standards and fuel standards, were successful in reducing emissions in NH. By 2008, New Hampshire’s ozone levels were below both the 1997 standard and the 2008 standard of 75 ppb.

In May 2012, EPA took three actions concerning New Hampshire’s status under both ozone standards. First, EPA declared New Hampshire to be “unclassifiable/attainment” with respect to the 2008, 75 ppb standard. Second, EPA revoked the 1997 standard for transportation conformity purposes only.

Third, EPA proposed approval of New Hampshire’s re-designation request to attainment under the 1997 standard which became effective March 4, 2013. Effective July 2013, the state began operating under a 10-year Maintenance Plan. Under this designation no additional regional air quality analyses will be required for Ozone.

In 2015, EPA issued a final rule setting forth the process for transitioning from the 1997 standard to the 2008 standard. It included various “anti-backsliding” requirements for the new standard. Also, conformity would no longer be required in any areas designated as attainment for the 2008 standard. EPA’s rule was in a lawsuit by the South Coast Air Quality Management District, which claimed that EPA

had exceeded its authority under the Clean Air Act by allowing transportation conformity requirements to be made only for the 2008 standard. They claimed that transportation conformity requirements must remain in effect for the 1997 standard in all nonattainment and maintenance areas for that standard, unless and until those areas are formally re-designated to attainment for the 1997 standard. In a February 2018 opinion, the D.C. Circuit struck down the 2015 rule, agreeing with the environmental groups on most of their challenges to the rule. Subsequently, the EPA filed a petition for rehearing with the D.C. Circuit, arguing that the Court had erred in its interpretation of the CAA anti-backsliding requirements. In September 2018 the Court ruled that transportation conformity requirements for the 1997 standard will come into effect in February 2019. Consequently, **it is anticipated that NRPC and the other New Hampshire MPOs will have to conduct air quality conformity for the next TIP and concurrent MTP updates in 2019.**

Nashua Carbon Monoxide Status

The City of Nashua and NRPC have been working to address the quality of the air with a focus on Carbon Monoxide (CO). Unlike Ozone, CO pollution is prevalent throughout the year and typically concentrated in urban areas with congested intersection and arterial roadways. Nashua was designated a non-attainment area for CO in 1980 by the EPA.

The Nashua Regional Planning Commission in its role as the Metropolitan Planning Organization has partnered with Nashua, NHDOT and NHDES to reduce mobile source emissions and meet the Ozone standards set by the Environmental Protection Agency (EPA). Over the last several years, intersection improvements, increased transit service and other transportation demand strategies have worked in conjunction with reduced tail pipe emissions to decrease the number of exceedances of the CO standard. By 2001 EPA designated Nashua “in attainment” with a Maintenance Plan requiring continued monitoring and air quality analyses to ensure the CO standard was not violated by proposed projects. In 2013 EPA approved a Limited Maintenance Plan for CO relinquishing the NRPC of additional air quality analyses for projects proposed in the Transportation Improvement Program (TIP) and MTP.

Air Quality - Looking Ahead

In addition to the prospect of reinstatement of air quality conformity determinations there continue to be air quality regulations in effect for transportation planning purposes. Provisions are in place prevent degradation of the improved air quality. The anti-backsliding provisions require that that New Hampshire continue vehicle inspection maintenance (I/M) programs, reasonably available control technology (RACT) and clean fuels programs. Anti-backsliding provisions of particular importance to MPOs include transportation control measures strategies to reduce vehicle emissions through transit use and Intelligent Transportation System (ITS) applications and technologies to offset growth in emissions from increased vehicle miles travelled. Therefore, the MPO must continue to implement strategies and projects that will continue to reduce transportation-related emissions.

Through New Hampshire’s Interagency Consultation process, it has been determined that the inclusion of non-exempt project(s) in the MTP and TIP Updates triggers the requirement for a new air quality transportation conformity determination for the City of Nashua carbon monoxide (CO) attainment area with a limited maintenance plan in place, in accordance with section 93.1 04(c)(2) of the Transportation Conformity Rule. These projects while triggering the need for a new air quality conformity determination for the City of Nashua do not require a regional carbon monoxide air quality analysis in accordance with 40 CFR 93.109(e) "Areas with limited maintenance plans".

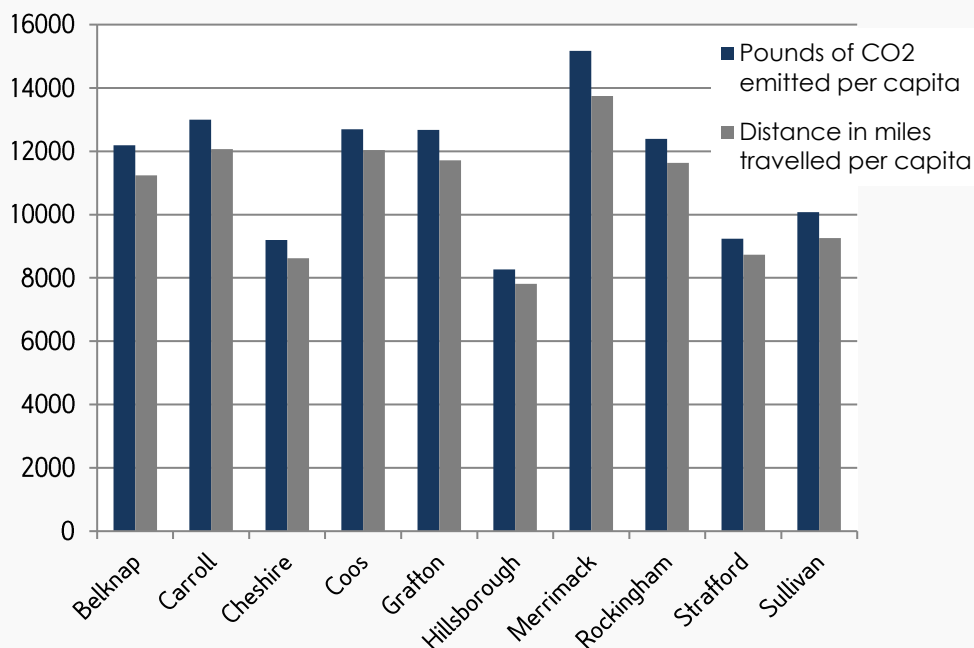
According to EPA's guidance on limited maintenance plans, the emissions budgets may be treated as essentially not constraining for the length of the maintenance period as long as the area continues to meet the limited maintenance criteria, because there is no reason to expect that these areas will experience so much growth in that period that a violation of the CO National Ambient Air Quality Standard would result. Therefore, for limited maintenance plan CO maintenance areas, all Federal actions that require conformity determinations under the transportation conformity rule are considered to satisfy the regional emissions analysis and "budget test" requirements in 40 CFR 93.118 of the rule. Since limited maintenance plan areas are still maintenance areas, however, transportation conformity determinations are still required for transportation plans, program and projects. The Nashua MPO has determined that the NRPC 2019-2045 MTP and 2019-2022 TIP are fiscally constrained and do not contain any Transportation Control Measures (TCMs). We therefore provide this recommendation for positive conformity determinations for these documents.

Carbon Dioxide

Carbon dioxide (CO₂) emissions are not currently regulated by the EPA under the NAAQS. Carbon dioxide is a naturally occurring chemical compound and atmospheric carbon dioxide is the primary source of carbon life on Earth. However, carbon dioxide is also emitted through the combustion of fossil fuels and its concentration in the atmosphere has increased rapidly since the Industrial Revolution. There is concern in the scientific community that the emission of carbon dioxide and other greenhouse gases contribute to Global Climate Change (EPA, 2014).

Carbon dioxide is the primary greenhouse gas emitted through human activities. In 2012, CO₂ accounted for 82 percent of all U.S. greenhouse gas emissions from human activities. In 2012, Hillsborough County accounted for approximately 23 percent of all CO₂ emissions in New Hampshire under a MOVES model simulation. The EPA's Office of Transportation and Air Quality (OTAQ) developed the Motor Vehicle Emission Simulator (MOVES) to estimate emissions for mobile sources covering a broad range of pollutants. The model currently estimates emissions from cars, trucks and motorcycles.

CO2 Emissions by NH County, 2012



Due in part to its more urban nature (relative to the rest of the state), Hillsborough County records fewer miles travelled and emits fewer pounds of CO2 per capita,

Source: MOVES Model simulation, NH DES

Hillsborough County accounts for approximately 30 percent of New Hampshire’s population; the county’s carbon emissions, on a per capita basis, are significantly less than its peer counties in the state. This is primarily a product of fewer miles traveled in the county, which at approximately 7,700 miles per capita in 2012 was the lowest in the state. Merrimack County, at approximately 13,800 miles traveled per capita, accounted for the highest distance traveled and per capita CO2 emissions in the state.

WATER QUALITY

Stormwater is water precipitation and snowmelt which does not infiltrate the ground but instead is discharged into water bodies. As stormwater flows toward storm drains or water bodies, it encounters surface pollutants like motor oil and fertilizer which contaminate the water before it deposits into water bodies. In New Hampshire, stormwater is the single greatest contributor to surface water pollution, accounting for 83 percent of all surface water quality impairments in the state.

The transportation sector is a significant contributor of stormwater pollution. Impervious surfaces like asphalt roadways and parking lots contribute to stormwater because they seal ground cover, preventing water infiltration. Stormwater encounters a host of pollutants as it flows over asphalt toward water bodies.

The EPA is currently finalizing new stormwater requirements for NH municipalities which will impact several communities in the Nashua Region. The EPA requirements will apply to municipalities in which a

minimum of 1,000 residents reside within a designated U.S. urbanized area, requiring them to obtain a federal Municipal Separate Storm Sewer System (MS4) permit in order to discharge stormwater into water bodies. The permit will require municipal action in addressing six areas related to stormwater: Public Education; public involvement; illicit discharge detection and elimination; construction runoff; post-construction stormwater management; and pollution prevention.

The MS4 permit requirements will apply to the Nashua Region municipalities of Amherst, Hudson, Litchfield, Merrimack, Milford, Nashua, and Wilton.

OPEN SPACE

The construction of transportation facilities often involves the disturbance of open spaces. This can be mitigated through land use policies that encourage growth proximate to existing major transportation corridors.

Only a single major transportation project has occurred in the region over the last 5 years that required the disturbance of open space. Construction of Raymond Weiczoreck Drive, a limited-access four-lane roadway linking the F.E. Everett Turnpike to Manchester Boston Regional Airport, occurred almost entirely outside the region within the municipalities of Bedford, Manchester and Londonderry. However, the project, which opened in 2011, did require the taking of some land in Merrimack to provide exit ramps for the roadway.

ENVIRONMENTAL JUSTICE

The Nashua Regional Planning Commission receives federal monies through the US DOT and FHWA and as a result is subject to consider and address the effects of all programs, policies, and activities on "minority populations and low-income populations." The Federal Highway Administration (FHWA) has incorporated environmental justice as part of their mission by involving the potentially affected public in developing transportation projects that fit harmoniously into the communities without any undue harm through displacement or sacrificing safety or mobility.

POVERTY

The Census Bureau uses a set of dollar value thresholds that vary by family size and composition to determine who is in poverty. Poverty thresholds for people living alone or with nonrelatives (unrelated individuals) vary by age (under 65 years or 65 years and older). The poverty thresholds for two-person families also vary by the age of the householder. If a family's total income is less than the dollar value of the appropriate threshold, then that family and every individual in it are considered "in poverty". Similarly, if an unrelated individual's total income is less than the appropriate threshold, then that individual is classified as being in poverty ([US Census Bureau, How Poverty is Calculated in the ACS](#))

Over the last two decades, most communities in the region have seen higher percentages of families and individuals living below the poverty level. This is consistent with county, state and national trends. Nashua contains 64% of the region's population below the poverty line and has a poverty rate of 11%. Mason and Mont Vernon also have higher than average regional poverty rates although the nominal figures are small due to the communities' low populations. Overall, the region has a poverty rate of 7.1%.

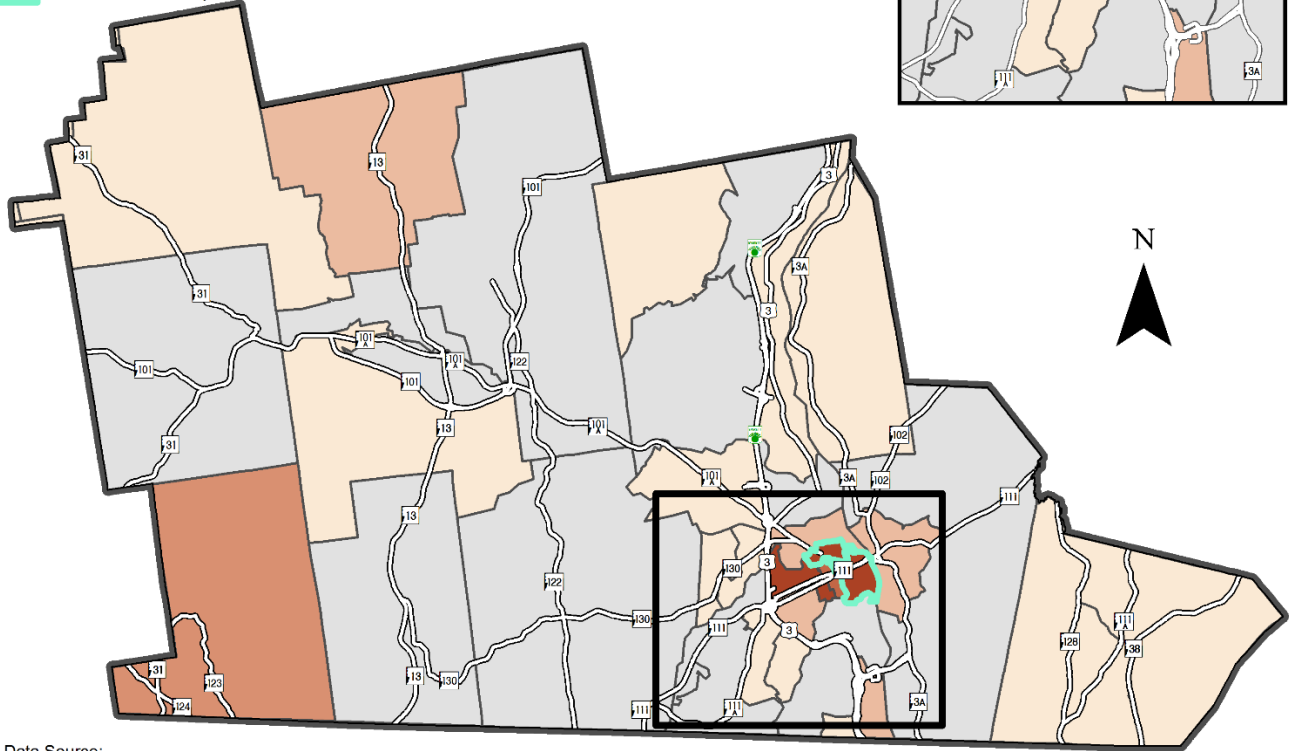
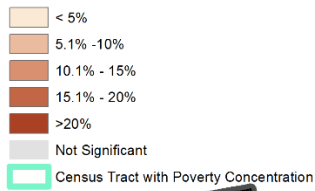
Poverty Rates by Municipality

	Total	Below	Poverty	Poverty Rate by Race or Origin				
	Pop *	Poverty	Rate	White	Black	Nat Amer	Asian	Hispanic
Amherst	11,215	324	2.9%	2.3%	0.0%	0.0%	0.0%	27.1%
Brookline	5,100	58	1.1%	1.2%	0.0%	0.0%	0.0%	0.0%
Hollis	7,733	159	2.1%	2.1%	0.0%	100.0%	0.0%	0.0%
Hudson	24,521	1,068	4.4%	4.3%	0.0%	0.0%	5.8%	3.6%
Litchfield	8,366	352	4.2%	4.3%	0.0%	0.0%	0.0%	0.0%
Lyndeborough	1,707	97	5.7%	5.7%	0.0%	0.0%	0.0%	29.6%
Mason	1,387	177	12.8%	10.9%	0.0%	0.0%	100.0%	0.0%
Merrimack	25,326	1,006	4.0%	3.8%	29.4%	55.6%	1.9%	0.1%
Milford	15,051	876	5.8%	5.8%	0.0%	0.0%	4.9%	0.0%
Mont Vernon	2,620	246	9.4%	9.1%	0.0%	0.0%	0.0%	0.0%
Nashua	85,434	9,379	11.0%	10.7%	18.2%	0.0%	7.1%	26.3%
Pelham	13,054	708	5.4%	5.0%	17.6%	0.0%	22.5%	21.5%
Wilton	3,681	157	4.3%	4.3%	5.9%	0.0%	0.0%	4.3%
NRPC Region	205,195	14,607	7.1%	6.7%	15.6%	9.8%	6.4%	22.2%

* Population for which poverty status is determined.

Poverty Level Populations – Nashua Region

Percentage of Households Below Poverty Level By Census Tract



Data Source:
2016 ACS Table B17017

See inset

MINORITY POPULATIONS

For the purposes of the US Census, minorities are defined as people who are NOT a single-race, non-Hispanic white. According to this definition, Hispanic whites are considered as minority, for example. The general concentration of minority population in the region can be found in and around the City of Nashua, particularly in the center of the city within the Tree Streets neighborhood, in southern Nashua near the state line, and along census tracts that intersect NH 101A near the Amherst and Merrimack borders. In these areas the percentage of minority population can be as high as 10-40% of the total tract population. Outside of the City of Nashua the region is fairly homogenous with concentrations of minorities as a percentage of population between 0-10%.

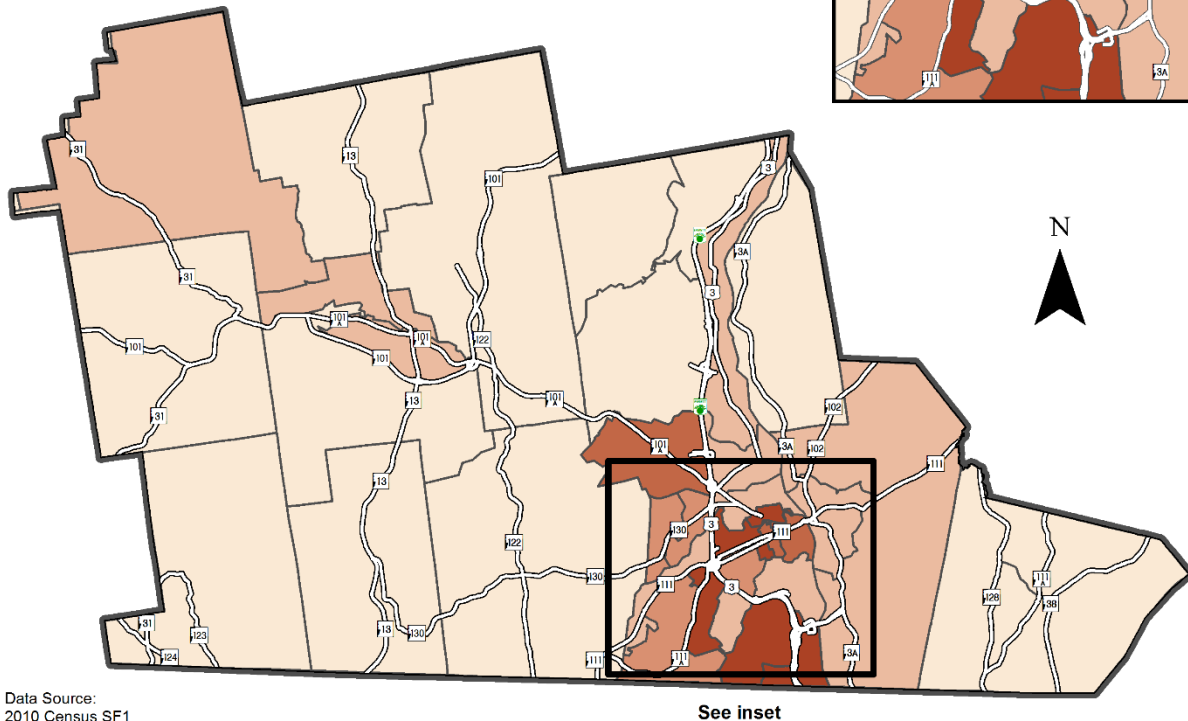
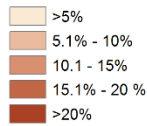
The City of Nashua is home to the largest concentrations of minorities in the region, particularly in the Downtown and South Nashua areas. Smaller minority concentrations are also located in Hudson, along the Daniel Webster Highway corridor in Merrimack, the Routes 101 and 101A corridor in Milford and throughout Lyndeborough.

Minority Population by Municipality

	<u>White</u>	<u>African Amer.</u>	<u>Native Amer.</u>	<u>Asian/ Pac Isl.</u>	<u>Other Single</u>	<u>Multi- Race</u>	<u>Total</u>	<u>Ethnic Hispanic</u>
Amherst	10,570	59	19	114	121	364	11,247	238
Brookline	4,934	0	0	46	0	120	5,100	23
Hollis	7,347	41	8	198	0	139	7,733	12
Hudson	23,275	313	0	772	18	304	24,682	671
Litchfield	8,193	14	43	33	0	83	8,366	234
Lyndeborough	1,653	7	0	25	3	19	1,707	20
Mason	1,347	0	0	3	5	35	1,390	50
Merrimack	24,337	89	18	539	231	381	25,595	661
Milford	14,184	101	13	416	374	106	15,194	452
Mont Vernon	2,599	0	0	10	0	11	2,620	28
Nashua	73,288	2,695	83	6,685	1,170	3,189	87,110	10,700
Pelham	12,642	74	0	87	58	252	13,113	337
Wilton	3,618	17	0	19	0	27	3,681	22
NRPC Region	187,987	3,410	184	8,947	1,980	5,030	207,538	13,448
Pct. of Total	90.6%	1.6%	0.1%	4.3%	1.0%	2.4%		6.5%

Minority Populations – Nashua Region

Minority Percentage of Total Population By Census Block



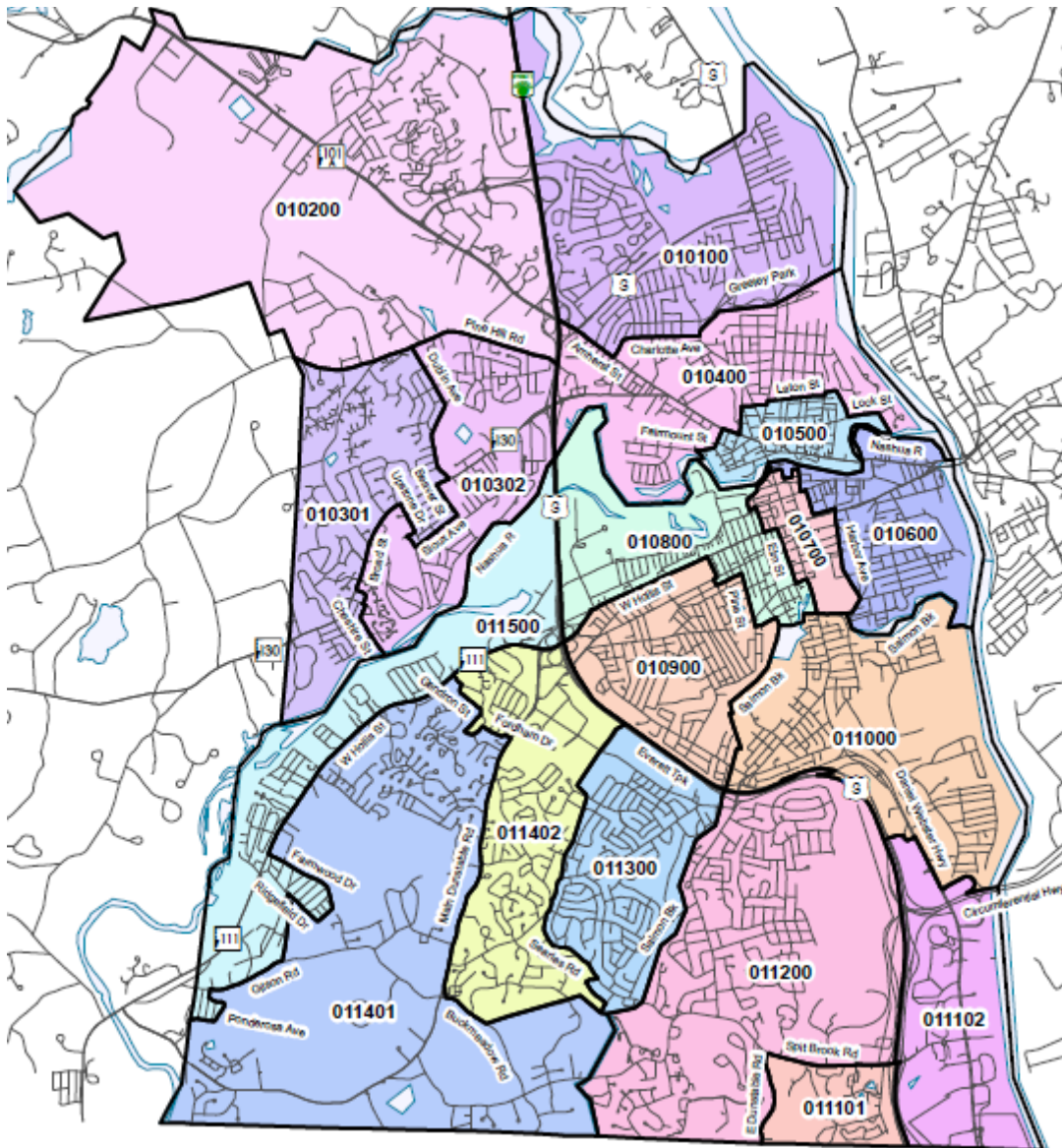
Environmental Justice Zones by Census Tract

The previous graphics for minority and poverty-level populations yield six census tracts in Nashua which are identified as EJ zones based on minority populations greater than 20% and two census tracts based on concentrated areas of poverty in Nashua. These include:

- 011102 28.9% non-white
- 010800 28.8% non-white
- 011101 24.8% non-white
- 011402 23.2% non-white
- 010500 22.3% non-white; 29.8% poverty
- 011200 20.6% non-white
- 010600 20.3% poverty

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These tracts relate to the neighborhoods shown in the accompanying map.



CONGESTION MANAGEMENT PROCESS

The Congestion Management Process (CMP) has been a mandate of Transportation Management Areas (TMA) since the enactment of the 2005 surface transportation act (SAFETEA-LU), which states:

“The transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53 through the use of travel demand reduction and operational management strategies.”[23 CFR § 450.320(a)]

The NRPC CMP includes the following components:

- Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, identify and evaluate alternative strategies and evaluate the effectiveness of implemented actions.
- Definitions of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement.
- Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion.
- Identification and evaluation of the anticipated performance and expected benefits.
- Development of an implementation schedule, along with information on implementation responsibility and possible funding sources for each strategy.

The following is a list of Congestion Management Reports (CMR) conducted by NRPC in recent years. A sample CMR is provided as an appendix to the MTP.

- NH 122 - Hollis & Amherst, 2017
- NH 111 West – Hollis & Nashua, 2017
- NH 111 East – Nashua & Hudson, 2017
- NH 101A West – Milford & Amherst, 2017
- NH 101A East – Merrimack & Nashua, 2017
- NH 101 East – Amherst, 2017
- NH 38 – Pelham, 2017
- NH 13 – Brookline & Milford, 2017
- NH 130 – Nashua & Hollis, 2017
- NH 102 – Hudson & Litchfield, 2017
- NH 3A – Hudson, 2016
- US 3 – Merrimack, 2016
- Daniel Webster Highway – Nashua, 2016
- FEE Turnpike South – Mass line to Exit 7 Nashua, 2016
- FEE Turnpike Central – Exit 7 to Exit 10 Merrimack, 2016
- FEE Turnpike North – Exit 10 to Bedford Line, 2016

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- Main Street – Nashua, 2016
- NH 101A Amherst St/Canal St/Bridge St – Nashua, 2016

Through 2017 CMP data were obtained primarily through iterative travel time runs and supplemented by vehicle probe-based data. The NHDOT and MPOs are partnering to utilize the National Performance Management Research Data Set (NPMRDS) beginning in 2018 as the primary tool for collecting travel time data on the NHS. This dataset covers most, but not all, highways monitored by NRPC. Rather than continue labor-intensive travel time runs, NRPC will utilize available online travel data, such as provided by SigAlert and Google Maps. Use of these data sources require iterative readings over at least several days during peak periods but are much more cost-effective than travel runs. These sources may be superior to the NPMRDS datasets in some instances. For example, one of the NPMRDS defined segments on the Everett Turnpike stretches from Exit 7 Nashua to the Airport Rd. Exit 13. This is a long segment with two gaps of two lanes per direction which bottleneck and experience much more congestion than the adjacent three-lane sections. Lumping the segments together to produce a single travel time does not yield useful data for congestion monitoring.

Summaries of congestion data are provided in the Existing Conditions section of this MTP.

PUBLIC INVOLVEMENT PROCESS

Summary of the MPO Adopted Public Involvement Process

Federal rules pertaining to the metropolitan transportation planning requirements contain specific minimum requirements for public involvement in transportation planning. Every Metropolitan Planning Organization (MPO) must develop, adopt and implement formalized procedures for effective community participation to be used during the development or updating of a Metropolitan Transportation Plan (MTP) or Transportation Improvement Program (TIP).

NRPC completed its last update of its Public Involvement Process in January 2012, with the following stated objectives:

- Seek input from a wide variety of individuals, groups and organizations affected by the transportation system.
- Establish public involvement early in the planning process, before key decisions are made.
- Develop transportation plans, programs and projects which reflect local, regional and state priorities and consider a range of transportation options.
- Satisfy the Nashua Transit System public participation process for the program of projects.

The document specifically includes the following procedures for the preparation and adoption of this Metropolitan Transportation Plan:

- Publish a Notice of Intent to update the MTP.
- Make the draft MTP available on the NRPC website and paper copies available for review at the NRPC office.
- Public notice of comment period and Public Hearing through local newspaper, the NRPC website, social media and electronic mailing to interested parties list.
- Public informational meetings at TTAC.
- Up to a 30-day public comment period.
- Public Hearing at the NRPC Commission meeting.

NASHUA REGION TRANSPORTATION SURVEY

The NRPC conducted an online transportation survey during the spring of 2018 to solicit input from the public on transportation challenges, priorities, desired improvements and potential additional revenue sources. The summary of these responses is incorporated into the Future Needs Analysis of this MTP. Other respondent data regarding trip purposes, modes and other transportation user characteristics were also collected and reported in the Existing Conditions section of this report. The survey was promoted through social media outlets, email and municipal websites. It yielded 573 responses and, although not administered as a scientific survey, it resulted in a greater degree of public feedback than any past efforts which entailed receiving public input through conducting open houses, charettes, etc. Being an online survey, it was open to all; however, 90% of respondents were residents of the NRPC region.

NRPC also conducted several surveys that support the Regional Transit Expansion Study. An onboard survey that reached 520 current fixed-route transit service riders was completed in June 2018. An

online survey of the general public regarding perceptions of transit service reached approximately 130 individuals. The online survey was supplemented by distribution of surveys to various locations around the region including town halls, libraries, social service providers and other places where people gather.

Additional outreach (charrettes, workshops) to businesses, municipalities, the general public and underserved populations (elderly, disabled, low income and minorities) will be undertaken in 2019 to support the Regional Transit Expansion Study.

COMMUNICATIONS WITH MUNICIPALITIES AND STAKEHOLDERS

In addition to the public survey effort conducted this year to solicit opinion on regional priorities and transportation workshops held in recent years, the NRPC maintains its public dialogue through communication and coordination with municipal governing bodies, planning boards, municipal staff through monthly meetings of the Transportation Technical Advisory Committee (TTAC). Projects which are located entirely within a community are added or removed only upon directive to do so by the governing body. NRPC met or communicated with several of its communities for clarification of project status for this MTP update. All project additions were done via the public solicitation process undertaken in 2017 and 2018 for MTP projects, CMAQ submissions in 2017 and TAP submissions in 2018.

The following are some of the other stakeholders that NRPC has worked with, either on a continuing or ad hoc basis:

- Nashua Regional Coordinating Council, which seeks to provide improved, cost-effective, coordinated services to persons with disabilities, the elderly and individuals with lower incomes.
- Nashua Transit System, through attendance at most staff meetings.
- Merrimack Town Center Committee, which has developed a plan for trails and sidewalks in the town center.
- Souhegan Valley Transportation Collaborative, a grassroots organization of area citizens concerned about transportation options in the Souhegan Valley.
- Wilton Safe Routes to School Steering Committee
- Brookline committee appointed by the Board of Selectmen to develop a Sidewalk and Trail Connection Plan.
- Milford-Brox Environmental Citizens dedicated to preserving an ecologically-sensitive area of Milford.
- Conservation Commissions throughout the region to coordinate on trail development and mapping.
- Pedestrian-Bicycle Work Group, which guided the development of the 2015 NRPC Regional Pedestrian Bicycle Plan. The work group will be called upon moving forward to assist further implementation of the regional bike ped plan.
- Public Advisory Committee for the NH Capitol Corridor & Transit Alternatives Analysis
- Nashua East Hollis Street Study Steering Committee
- Nashua East Hollis Street/Bridge Street Intersection Study Steering Committee
- Nashua Downtown Circulation Forum

EXISTING CONDITIONS

DEMOGRAPHICS

POPULATION

This section provides an overview of the population distribution and characteristics in the region and growth trends over the past twenty-five years. Changes in the region's population are dependent on two factors: the rate of natural change determined by births and deaths, and migration. As occurred throughout New Hampshire and much of the U.S. northeast, population growth in the NRPC region has subsided significantly since 2000. Between 1990 and 2000 the region experienced booming growth. Only Mason, which was not part of the NRPC region at that time, but now is, failed to show a population gain in that decade. Other than the maturely-developed City of Nashua, all municipalities experienced double digit population growth during that decade.

Between 2000 and 2010, regional population growth had declined to 4.5% from the 14% for the previous decade and was most pronounced in the eastern and western expanses of the region. Six municipalities experienced population growth greater than 10 percent and Nashua was essentially unchanged.

Between 2010 and 2015, population growth further slowed, showing a gain of just 0.9% to 207,500 according to the American Community Survey (ACS), which, it needs to be noted, has less statistical reliability than the decennial U.S. Census.

These population trends have implications for transportation planning and investment decisions. Slowing population growth enables policymakers to focus attention on a backlog of transportation needs that have gone unaddressed through the decades. For example, the opportunity exists to shift priorities from capacity increases throughout the transportation network to maintenance and improvement of the region's transportation infrastructure. A great deal of transportation infrastructure was constructed between the 1960's and late 1980's to serve rapid population growth. Much of this infrastructure is now in need of substantial maintenance and rehabilitation.

The Nashua region, as is true throughout New Hampshire, is aging at a faster rate than is occurring nationwide. Since 1990 the share of the region's population under 45 declined, while older cohorts have grown significantly. This trend was particularly pronounced among those aged 20 to 44, which declined from 45% of the population to 31%. Those in the 45 to 64 range increased in share from 18% to 31%.

Seniors 65 and older now constitute 13% of the population; only Brookline has less than a 10% share in this category. As seniors age, their motor skills, reflexes and vision may be impacted and the ability to operate an automobile may be diminished. Measured by miles traveled, seniors 70 years and older are more likely to be involved in fatal crashes than all but the youngest group eligible to drive. The likelihood for serious crashes is particularly pronounced among those age 85 and above. This is the age group most rapidly accelerating and is projected to more than triple by the year 2045.

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Population of NRPC Communities, 1990 to 2015

Municipality	Census <u>1990</u>	Census <u>2000</u>	% Growth <u>1990-00</u>	Census <u>2010</u>	% Growth <u>2000-10</u>	ACS <u>2015</u>	% Growth <u>2010-15</u>
Amherst	9,068	10,769	18.8%	11,201	4.0%	11,247	0.4%
Brookline	2,410	4,181	73.5%	4,991	19.4%	5,100	2.2%
Hollis	5,705	7,015	23.0%	7,684	9.5%	7,733	0.6%
Hudson	19,530	22,928	17.4%	24,467	6.7%	24,682	0.9%
Litchfield	5,516	7,360	33.4%	8,271	12.4%	8,366	1.1%
Lyndeborough	1,294	1,585	22.5%	1,683	6.2%	1,707	1.4%
Mason	1,212	1,147	-5.4%	1,382	20.5%	1,390	0.6%
Merrimack	22,156	25,119	13.4%	25,494	1.5%	25,595	0.4%
Milford	11,795	13,535	14.8%	15,115	11.7%	15,194	0.5%
Mont Vernon	1,812	2,034	12.3%	2,409	18.4%	2,620	8.8%
Nashua	79,662	86,605	8.7%	86,494	-0.1%	87,110	0.7%
Pelham	9,408	10,914	16.0%	12,897	18.2%	13,113	1.7%
Wilton	3,122	3,743	19.9%	3,677	-1.8%	3,681	0.1%
NRPC Region	172,690	196,935	14.0%	205,765	4.5%	207,538	0.9%

Source: U.S. Census and U.S. Census Community Survey

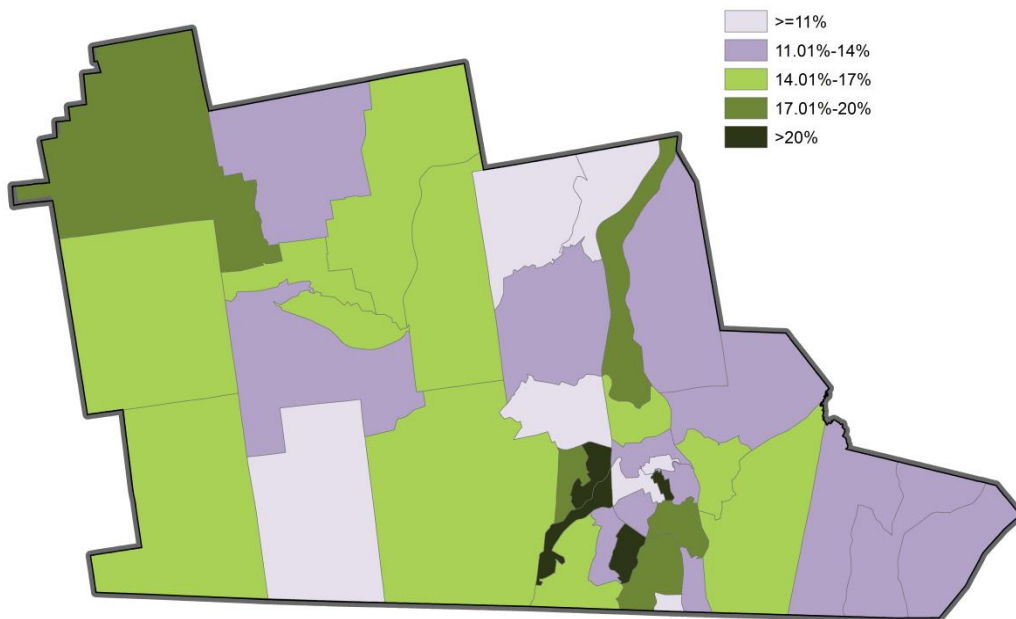
2015 Population by Age Group

	<u><20</u>	<u>Pct</u>	<u>20-44</u>	<u>Pct</u>	<u>45-64</u>	<u>Pct</u>	<u>65+</u>	<u>Pct</u>	<u>Total</u>
Amherst	3,278	29%	2,470	22%	3,859	34%	1,640	15%	11,247
Brookline	1,588	31%	1,307	26%	1,787	35%	418	8%	5,100
Hollis	1,917	25%	1,497	19%	3,204	41%	1,115	14%	7,733
Hudson	6,491	26%	7,839	32%	6,923	28%	3,429	14%	24,682
Litchfield	2,393	29%	2,257	27%	2,733	33%	983	12%	8,366
Lyndeborough	340	20%	431	25%	654	38%	282	17%	1,707
Mason	353	25%	299	22%	564	41%	174	13%	1,390
Merrimack	6,179	24%	7,555	30%	8,694	34%	3,167	12%	25,595
Milford	3,802	25%	4,564	30%	4,780	31%	2,048	13%	15,194
Mont Vernon	771	29%	572	22%	963	37%	314	12%	2,620
Nashua	20,583	24%	30,201	35%	24,831	29%	11,495	13%	87,110
Pelham	3,444	26%	3,722	28%	4,323	33%	1,624	12%	13,113
Wilton	845	23%	980	27%	1,298	35%	558	15%	3,681
NRPC Region	51,984	25%	63,694	31%	64,613	31%	27,247	13%	207,538

Source: U.S. Census American Community Survey

The following map illustrates that several Nashua neighborhoods and eastern Merrimack have the highest concentration of seniors in the region.

Share of Population Age 65 and Over, Nashua Region



At the other end of the age range, 25% are 19 and younger. Those who are at least age 16 are eligible to operate a motor vehicle in New Hampshire. Young people, and particularly young males, are significantly more likely to be involved in fatal crashes than other age groups. In 2012, for every 100,000 of the U.S. population, an average of 27.6 males and 18.8 females between the ages of 20-24 died in fatal crashes; the highest rate of any age group including those over 84. Several factors are believed to impact the higher rate of fatalities among young people including driver inexperience and a greater likelihood to adopt risky driving behaviors, including speeding, and distracted or impaired driving.

Recent research suggests that young people are less likely to pursue a driver's license than previous generations. For example, in 1983, approximately 70 percent of 18-year-olds nationwide had obtained a driver's license, however by 2010 only 49 percent had done so (Varga, 2014). Other research suggests young people are less likely to purchase automobiles than previous generations. In 2010, those between the ages of 21 and 34 purchased 27 percent of all new cars in America, down from 38 percent in 1985 (Tuttle, 2013). This trend has been attributed to a host of potential factors, including stagnation in

household income in recent years, less interest in automobile ownership than previous generations and increased sensitivity to environmental concerns resulting from auto usage. These and potential other factors warrant the continued monitoring of trends of auto usage, as they will impact the types of transportation investments required for the future.

Household Income Distribution

		\$15k -	\$25k -	\$35k -	\$50k -	\$75k -	\$100k -	\$150k -		Median
	<u><\$15k</u>	<u>\$24k</u>	<u>\$35k</u>	<u>\$50k</u>	<u>\$75k</u>	<u>\$100k</u>	<u>\$150k</u>	<u>\$200k</u>	<u>>\$200k</u>	<u>HH Inc.</u>
Amherst	1.9%	3.7%	4.5%	7.9%	9.3%	12.4%	25.1%	17.0%	18.2%	\$121,779
Brookline	1.6%	0.8%	3.0%	5.4%	12.0%	15.7%	27.7%	22.4%	11.4%	\$116,791
Hollis	2.5%	4.4%	4.3%	6.2%	13.5%	5.8%	25.7%	14.7%	22.9%	\$120,461
Hudson	4.3%	4.1%	6.5%	8.8%	18.6%	16.0%	22.3%	11.0%	8.4%	\$88,870
Litchfield	2.7%	5.4%	4.5%	8.5%	17.7%	15.9%	23.8%	14.1%	7.4%	\$91,727
Lyndeborough	5.4%	3.0%	2.2%	11.7%	19.2%	22.1%	18.3%	8.4%	9.7%	\$84,444
Mason	6.8%	5.0%	6.3%	7.5%	18.6%	11.3%	22.7%	11.1%	10.7%	\$88,942
Merrimack	4.3%	3.8%	4.0%	10.1%	15.6%	16.9%	22.6%	12.5%	10.2%	\$93,798
Milford	4.6%	9.6%	8.4%	13.8%	15.7%	16.1%	19.7%	6.7%	5.4%	\$71,500
Mont Vernon	2.3%	6.4%	4.3%	5.6%	11.4%	18.3%	26.2%	11.9%	13.6%	\$102,109
Nashua	8.3%	8.9%	8.1%	12.4%	16.1%	15.2%	18.3%	7.0%	5.7%	\$68,944
Pelham	3.5%	3.9%	7.7%	7.7%	17.0%	12.2%	22.2%	12.8%	13.0%	\$94,167
Wilton	6.1%	3.2%	7.7%	14.5%	23.1%	15.8%	17.5%	6.8%	5.3%	\$71,083
Hillsborough										
County	7.1%	7.4%	7.8%	11.4%	17.4%	14.6%	18.7%	8.3%	7.3%	\$73,189
State of NH	7.8%	8.0%	8.3%	12.1%	18.2%	14.3%	17.3%	7.4%	6.6%	\$68,485

Source: U.S. Census American Community Survey

EMPLOYMENT AND COMMUTING

Single-occupancy driving continues to be the dominant mode of commuting in the region, with an 83% mode share. Shared ride accounts for just under 8% of all work trips and transit just 1%. Walking accounts for 1.6% of trips and bicycle commuting is negligible. About 6% work from home. Nearly 42% reported travel time to work of thirty minutes or greater, with 12% commuting 60 minutes or more.

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Mode of Transportation to Work

	Drive Alone	Shared Ride	Public Transp.	Bicycle	Walk	Other	Work at Home	Total
Amherst	4,752	217	15	24	40	20	552	5,620
Brookline	2,359	107	0	0	7	8	311	2,792
Hollis	2,978	241	10	1	68	14	467	3,779
Hudson	10,843	810	60	0	97	43	665	12,518
Litchfield	3,796	329	22	0	51	15	163	4,376
Lyndeborough	764	69	0	0	0	3	107	943
Mason	634	44	3	0	10	8	48	747
Merrimack	12,249	841	46	28	155	57	1,080	14,456
Milford	6,656	662	0	0	174	33	556	8,081
Mont Vernon	1,181	168	0	0	29	0	132	1,510
Nashua	36,694	4,374	826	98	1,046	228	2,045	45,311
Pelham	5,954	452	31	0	43	16	394	6,890
Wilton	1,600	153	0	0	16	8	239	2,016
NRPC Region	90,460	8,467	1,013	151	1,736	453	6,759	109,039
Mode Share	83.0%	7.8%	0.9%	0.1%	1.6%	0.4%	6.2%	

Source: U.S. Census American Community Survey

Commute Time to Work (minutes)

	<u><10</u>	<u>10-19</u>	<u>20-29</u>	<u>30-34</u>	<u>35-44</u>	<u>45-59</u>	<u>60-89</u>	<u>90+</u>	<u>Total</u>
Amherst	418	1,094	1,347	571	465	455	488	230	5,068
Brookline	169	269	585	523	217	307	264	147	2,481
Hollis	382	618	673	402	244	524	381	88	3,312
Hudson	1,080	2,594	2,719	1,591	1,136	1,369	1,093	271	11,853
Litchfield	297	801	1,070	779	250	464	377	175	4,213
Lyndeborough	37	183	141	91	95	128	111	50	836
Mason	38	102	101	53	132	74	157	42	699
Merrimack	1,301	3,679	4,054	1,261	605	861	1,218	397	13,376
Milford	1,016	1,421	1,056	1,477	775	872	603	305	7,525
Mont Vernon	44	305	237	266	194	147	157	28	1,378
Nashua	5,602	13,997	7,851	4,801	3,295	3,339	3,193	1,188	43,266
Pelham	473	1,352	1,360	1,000	631	953	489	238	6,496
Wilton	269	368	212	223	295	219	95	96	1,777
NRPC Region	11,126	26,783	21,406	13,038	8,334	9,712	8,626	3,255	102,280
Pct. Of Total	10.9%	26.2%	20.9%	12.7%	8.1%	9.5%	8.4%	3.2%	

Source: U.S. Census American Community Survey

MTP Survey Respondent Travel Characteristics

Additional data on travel characteristics were obtained through the MTP survey. Although not a scientific sample, the 573 responses are enough to provide some degree of profile of regional travel.

- 72% are employed at a fixed location outside the home, 7% work from home, 4% work at no fixed location and 18% are retired or not employed.
- 28% work in Nashua, 9% in Merrimack, 4% in Hudson, 9% in the Manchester area, 11% in other NH areas, 31% in Massachusetts and 9% elsewhere.
- 91% drive alone to work, 3% carpool 3% take the train to Boston, 2% take NTS or Boston Express.
- 54% of commuters rarely or never telecommute, 24% up to a few times a month, 16% once a week or more and 5% on a daily basis.
- Only 2% carpool daily, 1% said once a week or more, 4% up to a few times a month and 92% rarely or never.
- Regarding the potential purchase of an autonomous auto, 22% said likely, 64% not likely and 15% were not sure.
- 53% said they were likely to purchase an electric vehicle, 34% unlikely and 13% were not sure.
- 50% have never used ride services such as Uber and Lyft, 28% have used regularly, 19% occasionally and only 3% use frequently. 33% of respondents use the service for restaurants or other social events; 10% use for access to transit.
- While 50% of respondents use bicycles for recreation, only 10% use for actual trip purposes (work 4%, personal business 5%, transit access 1%)
- 44% have never taken Boston Express from Nashua to Boston, 21% rarely ride, 30% occasionally and 5% are frequent users of the service.
- 48% have never taken passenger rail from Lowell to Boston, 28% rarely use the service, 19% occasionally and 5% frequently.

REGIONAL ROAD NETWORK

Automobile travel is the dominant form of transportation in the Nashua Region and the area enjoys an extensive road, highway and bridge network. The region's principal north-south transportation routes include the F. E. Everett Turnpike, NH3A, NH102, NH38, NH128, NH122, NH13, NH31 and the Daniel Webster Highway. Principal east-west transportation routes include NH101, NH101A, NH130 and NH111.

NORTH-SOUTH ROUTES

F. E. Everett Turnpike

The F.E. Everett Turnpike is the primary north/south arterial in the region. The Turnpike runs from the Massachusetts State Line northward, through Nashua and Merrimack, and exits the region at the Merrimack/Bedford border. It connects the greater Boston area with the Nashua region and provides access to the central and northern areas of New Hampshire. Construction of the F. E. Everett Turnpike began in 1953. By 1966, the turnpike extended 45 miles between the New Hampshire/Massachusetts border and the state's capitol in Concord. Interchanges have been added and improved through the years; the most recent interchange, which provides access to the Manchester Regional Airport, opened to traffic in 2011 just north of the region in Bedford.

The Turnpike is median-divided, and the number of travel lanes varies from three in each direction from the Massachusetts state line northward to approximately Exit11 in Merrimack where it narrows to two lanes in each direction.

Traffic volumes vary from 91,560 (AADT, 2017) at the Massachusetts State line to 124,930 (AADT, 2017) between interchanges 5 and 6 in Nashua to 48,650 (AADT, 2017) at the Bedford tolls.

The rate of change in traffic volume at the New Hampshire-Massachusetts state line was +1.2% (2006-17), +0.5% between Interchanges 5 & 6 (2007-17), +3.5% (2009-17) between Interchange 7 & 8, +4.9% (2009-17), +3.3% (2012-17) between Interchanges 12 & 13, and -0.6% (2007-17) at the Bedford Tolls.

Daniel Webster Highway

The Daniel Webster Highway (DWH) provides an alternative north/south corridor to the Turnpike in Nashua and Merrimack, extending from the Massachusetts state line through Nashua to the Henri Burque Highway where it rejoins US 3. It then continues through Merrimack where it exits the region at the Bedford town line.

The portion of the DWH in South Nashua that runs from the Massachusetts State line to Interchange 3 of the F.E. Everett Turnpike serves several vital transportation functions. It is the main thoroughfare for the South Nashua Commercial District that attracts consumers in both southern New Hampshire and Massachusetts. Its location on the state border encourages shoppers to enjoy New Hampshire's sales tax-free environment.

Traffic volumes on this south section of the highway vary from 18,880 (AWDT, 2018) at the Massachusetts State line to 21,550 (AWDT, 2018) just south of the Sagamore Bridge.

The rate of change in traffic volume at the New Hampshire-Massachusetts state line was -1.4% (2004-18) and -1.8% (2003-18) just south of the Sagamore Bridge.

The portion of DWH in Merrimack serves as a major north-south corridor for Merrimack and it overlaps

with U.S. Route 3. The route runs from the southeastern to the northeastern portion of the town, paralleling the F.E. Everett Turnpike and the Merrimack River.

Traffic volumes vary from 12,490 (AWDT, 2016) at the Merrimack-Nashua town line to 14,750 (AWDT, 2012) just south of Bedford Road.

The rate of change in traffic volume at Nashua-Merrimack t/l was -2.2% (2004-16) and -0.6% (2005-17) just south of Bedford Road.

NH3A

NH 3A serves as the major north-south thoroughfare in the Nashua Region east of the Merrimack River. The portion of the corridor in Hudson comprises Lowell Rd and River Rd, which serves several local and region transportation functions.

The route also parallels U.S. Route 3 at this juncture and the Merrimack River, thereby connecting Litchfield with Tyngsborough, Massachusetts. It is an alternative commuting route for those working within southern New Hampshire and metropolitan Boston area. It is also an important road for freight transportation and local attractions, including the Walmart, various shopping plazas, Hudson Center.

Traffic volumes vary from 7,700 (AWDT, 2017) at the New Hampshire-Massachusetts state line to 39,900 (AWDT, 2017) just north of Sagamore bridge to 26,330 (AWDT, 2017) north of Ledge Street to 12,680 (AWDT, 2016), at the Litchfield-Manchester town line.

The rate of change in traffic volume at the New Hampshire-Massachusetts state line is -0.9% (2005-17), -1.6 (2005-17) just north of Sagamore bridge, -0.8 (2005-17) north of Ledge Street to +3.0% (2004-16) at the Litchfield-Manchester town line.

NH102

NH 102 provides a critical east-west connection between the Nashua region to the west and the Seacoast region to the east, as well as to points north and south via I-93 Exit 4. Within the Nashua Region, NH 102 serves an alternative east-west corridor to NH 111.

Traffic volumes vary from 15,750 (AWDT, 2018) in downtown Hudson to 16,900 (AWDT, 2016) at Hudson-Litchfield town line to 14,570 (AADT, 2017) at the Hudson-Londonderry town line.

The rate of change in traffic volume in downtown Hudson is -2.0% (2006-18), -0.1% (2004-16) at Hudson-Litchfield t/l and -0.8% (2006-17) at the Hudson-Londonderry town line.

NH38

NH 38 runs generally northeasterly through Pelham between the New Hampshire-Massachusetts state line and the Salem town line. The route provides access to Massachusetts and I-93.

Traffic volumes vary from 13,767 (AADT, 2015) at the state line to 12,304 (AWDT, 2014) at the Salem town line.

The rate of change in traffic volume at the state line was +0.5% ((2006-18) and +0.2% at the Salem town line.

NH128

NH128 also runs north-south through Pelham and provides access to Lowell, Massachusetts. NH 128 also provides an alternative route to Manchester, NH.

Traffic volumes vary from 10,403 (AWDT, 2018) at the state line to 5,621 (AWDT, 2018) at the Windham town line.

The rate of change in traffic volume at the state line was -1.1% (2006-18) and was 0.0% (2006-18) at the Windham town line.

NH122

NH 122 provides a north-south corridor west of Nashua from the Massachusetts state line through Hollis and Amherst. Traffic volumes vary from 2,410 (AWDT, 2018) at the Massachusetts state line to 4,290 (AWDT, 2018) at the Amherst town line, to 8,055 (AWDT, 2017) near the NH122-NH101 interchange.

The rate of change in traffic volume was +0.8% at the state line (2006-18), -1.0% (2006-18) at the Amherst town line and 0.0% (2005-17) at the NH122-NH101 interchange.

NH13

NH 13 provides a north-south corridor from the Massachusetts state line in Brookline through Milford and Mont Vernon. It provides an important economic link between Massachusetts and employment and retail centers in the Nashua-Milford area. It also provides an important link between Milford and the rural areas to the north and west.

Traffic volumes vary from 7,310 (AWDT, 2018) at Massachusetts state line, 12,370 (AWDT, 2016) just south of NH101 in Milford, 5,482 (AWDT, 2016) just north of NH101 in Milford and 3,400 at the Mont Vernon-Milford t/l

The rate of change in traffic volume +0.7% at the state line (2006-18), +0.2% just south of NH101 (2004-16) and -1.7% just north of NH101 (2004-16) and -5.4% (2006-15) at the Mont Vernon t/l.

East-West Routes

NH101A

NH101A is part of the National Highway System (NHS) and is a primary east/west corridor west of the Merrimack River. It extends east from Milford to downtown Nashua where it terminates at the intersection of Main Street, providing access to the downtown business district and South Nashua and Massachusetts (as Daniel Webster Highway); Concord Street, which provides access to Merrimack and points north as it rejoins US 3 at the Henri Burque Highway intersection; and NH 111A (Canal Street), which continues east across the Merrimack River into Hudson, ultimately connecting with I-93 (as NH 111). NH101A serves as both a travel and retail corridor with heavy development in Nashua, Merrimack and Amherst. Until the 1970s, Route 101A was a two-lane rural road. As the communities west of Nashua grew, so did traffic volumes along 101A. In the mid-70s, the road was widened to 5-lanes from the Nashua/Merrimack town line westerly to just over the Amherst town line, and between 1987 and 1990, the rest of the roadway was widened to its intersection with the NH 101 Bypass in Milford.

Traffic volumes vary from 7,620 (AWDT, 2018) at the west end of Milford, 12,650 (AWDT, 2016) just east of the Milford Oval, to 41,680 (AWDT, 2016) at Merrimack-Nashua t/l, to 20,050 (AWDT, 2016) near Main Street in Nashua.

The rate of change in traffic volume was -1.4% (2006-18) in West Milford, -2.1% east of the Oval (2004-16), -0.9% at Nashua T/L (2004-16) and -1.1% near Main Street in Nashua (2004-16).

NH101

NH 101 is also part of the NHS and is a primary east/west corridor in southern New Hampshire, connecting the Nashua Region to the Keene in the western part of the state and the Seacoast to the east. In the western of the region, NH 101 connects Wilton, Milford and Amherst; it also connects the western end of the region to Nashua via an interchange with NH 101A.

Traffic volumes vary from 10,590 (AWDT, 2016) at the west end of the region, 27,900(AWDT, 2018) on the Milford bypass east of NH13, to 21,130 (AWDT, 2017) at Bedford t/l.

The rate of change in traffic volume was -1.1% at the west of the region (2004-16), 0.0% on the bypass (2006-18) and +1.1% at the Bedford t/l (2008-17).

NH130

NH 130 extends westerly from Nashua, providing access to Hollis and Brookline where it intersects with NH 13.

Traffic volumes vary from 12,440 (AWDT, 2017) just west of NH101A (Amherst Street) in Nashua to 31,277 (AWDT, 2016) over the FEE Turnpike, 8,790 (AWDT, 2018) at Nashua-Hollis t/l, to 2,450 (AWDT, 2017) at NH13 intersection.

The rate of change in traffic volume was -2.8% west of Amherst Street (2005-17), -0.1% over the Turnpike (2004-16), -0.6% (2006-18) at Nashua-Hollis t/l and +1.1% (2005-17) at NH13 intersection in Brookline.

NH111

NH 111 is an east-west arterial roadway that traverses through the communities of Hollis, Nashua and Hudson in this region. It extends from the southeastern corner of Hollis, through downtown Nashua, over the Merrimack River and into Hudson before exiting the region at the Hudson-Windham town line and eventually connecting with I-93 via Exit 3 in Windham, NH.

Route 111 is a major transportation corridor, providing east-west commuters with access to the Frederick E. Everett Turnpike and Main Street in Nashua. The corridor also accommodates retail and commercial services along various portions of its route.

The roadway crosses over the Merrimack River into the Town of Hudson via Taylor Falls Bridge where it intersects with NH3A and NH102. This segment represents a major regional traffic choke point as it is the only river crossing for several miles in either direction.

Traffic volumes vary from 8,220 (AWDT, 2018) at the Massachusetts State line, 43,140 (AWDT, 2017) over the F. E. Turnpike, approximately 11,070 (AWDT, 2018) west of Nashua Main St, 14,560 (AWDT, 2016) in downtown Hudson (east of Library Street) and 16,530 (AWDT, 2018) as it exits the region at the Windham t/l.

The rate of change in traffic volume at the Massachusetts state line was +1.2% (2007-18), -0.9% on West Hollis Street (2006-18), -2.2 on East Hollis Street (2005-17), -0.7 (2004-16) in downtown Hudson and +0.2 (2006-18) at the Windham t/l.

Crossing the Merrimack River

There are only two crossings of the Merrimack River within the Region. The northern-most crossing, between downtown Nashua and Hudson Center, is comprised of two one-way bridges: the Taylor Falls Bridge, mentioned above, crosses the river in the easterly direction, and the Veterans Memorial Bridge crosses in the westerly direction. Both bridges carry two lanes of traffic and are consistently plagued by serious intersection capacity problems on both sides of the River. The traffic volume on the Taylor Falls Bridge at the Nashua-Hudson town line was 36,820 (AWDT, 2016) and the rate of change in traffic volume was -0.3% (2001-16).

The Sagamore Bridge is the second and southernmost crossing of the Merrimack River in the region. The bridge was expanded as part of the Circumferential Highway project and connects the F.E. Everett Turnpike and Daniel Webster Highway with NH 3A in Hudson. This is a high capacity bridge with four lanes of traffic in each direction. The bridge is a major commuting route for residents east of the Merrimack River seeking to access the Turnpike. Adjacent to the Sagamore Bridge is the only dedicated bicycle pedestrian crossing of the Merrimack in the region. The traffic volume on the bridge at the Nashua-Hudson town line was 49,740 (AWDT, 2018) and the rate of change in traffic volume was +1.4% (2003-18)

In November 2011, the Manchester Airport Access Road (MAAR) opened. This road provides another crossing of the Merrimack River just beyond northern most portion of the NRPC region. While the primary purpose of the road is to provide direct access to the Manchester Airport from the F. E. Everett Turnpike, it also improves access to Litchfield. Past analyses have suggested that the MAAR is located too far north to significantly reduce traffic crossing at the Taylor Falls/Veterans Memorial Bridge or the Sagamore Bridge. Traffic counts collected by NH DOT support those forecasts as traffic counts at Sagamore Bridge were virtually unchanged in 2012 and 2013 after construction of MAAR in 2011. NRPC is currently monitoring traffic volumes along the NH 3A in Litchfield and Hudson as well as the Daniel Webster Highway in Merrimack to assess the impact/benefit of the MAAR on regional traffic flow.

NHDOT Highway Tiers

NHDOT has developed a roadway classification system that groups the state's roads into five tiers. The system is focused on managing the state's road network as efficiently as possible. While every road is critical to the people and businesses that rely upon it, each road also serves a different number of users and provides different levels of mobility. Grouping based on similarities such as connectivity, regional significance, and winter maintenance requirements provides a common framework for analysis of condition and performance, investment levels, and operation and maintenance levels. To strategize the investment of scarce resources, the Department has categorized New Hampshire's road system into the tiers found in the table to the right. The table includes only those roads in Tiers 1-5 and does not include the Tier 6/Off Network facilities.

NHDOT Tier System

Statewide Transportation Corridors

Highways that provide statewide travel and carry high traffic volume at high speeds.

- **Tier 1:** Interstates, turnpikes, and divided highways (Examples: FEE Turnpike)
Miles in Nashua Region: 64.34
Percent of Total Miles in Nashua Region: 4.2
- **Tier 2: Other statewide corridors** (Examples: Sagamore Bridge, NH101, NH101A, NH102)
Miles in Nashua Region: 87.32
Percent of Total Miles in Nashua Region: 5.6

Regional Transportation Corridors

- **Tier 3:** Highways that provide travel within regions and to access statewide corridors (Examples: NH122, NH130-Hollis/Brookline)
Miles in Nashua Region: 52.88
Percent of Total Miles in Nashua Region: 3.4

Local Connectors

- **Tier 4:** Roadways that provide travel between and within communities (Examples: Depot Rd-Hollis, N. River Rd-Milford)
Miles in Nashua Region: 35.25
Percent of Total Miles in Nashua Region: 2.3

Local Roads

- **Tier 5:** Community-owned roadways that provide local access
Miles in Nashua Region: 1,308.86
Percent of Total Miles in Nashua Region: 84.5

Traffic Volumes and Trends

Motor vehicle traffic volume counts are collected in cooperation with NH Department of Transportation (NHDOT) to support the Highway Performance Monitoring System (HPMS). The HPMS is a nationwide database detailing the condition and use of local, state, and federal roads.

Traffic count locations are determined by the NHDOT to fulfill reporting requirements under the HPMS. There are approximately 385 HPMS locations in the region, counted on a rotating basis. Staff typically collects data at approximately 130 locations during the traffic counting season.

NRPC collects additional local traffic data at the request of town officials. These local efforts support specific local municipal projects such as traffic circulation studies, intersection analyses, and signalization projects. Finally, data is collected for planning purposes as determined by NRPC staff.

In all, NRPC maintains a database of over 1,000 historical traffic counts. Traffic count data is available through the NRPC's online Transportation Viewer. <https://www.nashuarpc.org/transview/>

Traffic volumes can be used to calculate a volume to capacity ratio (VC), which is a measure of how efficiently traffic is flowing on a roadway segment. Volume to capacity compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a V/C of 1.00 indicates the roadway facility is operating at its capacity. A V/C ratio greater than one indicates the roadway facility is operating beyond its capacity (and is therefore congested)

The following table lists traffic counts, trends and V/C ratio along key corridors in the region.

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Existing Traffic Volumes and Trends, Volume-to-Capacity

<u>Highway</u>	<u>Location</u>	<u>Existing AWDT</u>	<u>Ct Trend Years</u>	<u>Annual % Change</u>	<u>Vol/Cap</u>
Taylor Falls Bridge	Nashua/Hudson T/L	36,820	2001-16	-0.3%	1.02
Sagamore Bridge	Nashua/Hudson T/L	49,740	2003-18	1.4%	0.64
FEE Turnpike	Mass. S/L	91,560	2006-17	1.2%	0.78
FEE Turnpike	B/t Interchange 2 & 3	108,800	2006-17	1.3%	0.62
FEE Turnpike	B/t Interchange 4 & 5	113,000	2006-17	1.3%	0.64
FEE Turnpike	B/t Interchange 5 & 6	141,300	2007-17	1.7%	0.72
FEE Turnpike	B/t Interchange 7 & 8	97,000	2009-17	3.8%	0.55
FEE Turnpike	b/t Interchange 8-10	81,200	2009-17	5.2%	1.04
FEE Turnpike	B/t Interchange 10 & 11	72,500	2006-17	1.6%	0.62
FEE Turnpike	B/t Interchange 11 & 12	73,600	2006-17	2.7%	0.94
FEE Turnpike	B/t Interchange 12 & 13	64,000	2012-17	3.8%	0.82
FEE Turnpike	Bedford Tolls	49,700	2007-17	-0.4%	0.64
NH101 - Wilton	W. of Wilton Center Rd	10,600	2004-16	-1.1%	0.50
NH101 - Milford	E. of Wilton Rd	23,690	2006-18	-0.8%	0.90
NH101 - Milford	W. of NH13	19,990	2006-18	-0.4%	0.67
NH101 - Milford	E. of NH13	27,900	2006-18	0.0%	0.93
NH101 - Amherst	N. of Baboosic Lake Rd	22,010	2006-18	-0.8%	0.73
NH101 - Amherst	Bedford T/L	21,130	2008-17	1.1%	0.70
NH101A - Milford	W. of Old Wilton Rd	7,620	2006-18	-1.4%	0.46
NH101A - Milford	E. of Cottage St	14,450	2009-18	1.9%	0.87
NH101A - Milford	E. of Oval	12,650	2004-16	-2.1%	0.79
NH101A - Amherst	E. of NH122	30,670	2004-16	1.3%	0.77
NH101A - Merrimack	Hollis T/L	36,480	2004-16	0.3%	0.91
NH101A - Merrimack	Nashua T/L	41,680	2004-16	-0.9%	0.67
NH101A - Nashua	E. of Thornton Rd	42,310	2006-17	-1.8%	0.85
NH101A - Nashua	E. of Henri Burque	24,370	2006-18	-0.7%	0.43
NH101A - Nashua	W. of Main St	20,050	2004-16	-1.1%	0.70
NH130 - Brookline	Milford St east of NH13	2,450	2005-17	1.1%	0.15
NH130 - Hollis	at Hollis T/L	6,510	2006-18	0.7%	0.39
NH130 - Nashua	at Nashua C/L	8,790	2006-18	-0.6%	0.59
NH130 - Nashua	west of FEET	37,170	2006-15	2.3%	0.94
NH130 - Nashua	west of NH101A	12,440	2005-17	-2.8%	0.83
NH111 - Hollis	Mass S/L	8,220	2007-18	1.2%	0.48
NH111 - Nashua	Hollis T/L	9,980	2004-16	-0.5%	0.59
NH111 - Nashua	over FEET	43,140	2006-17	-1.1%	0.80
NH111 - Nashua	Kinsley St W. of Ritter St	11,510	2005-17	-2.1%	0.69
NH111 - Nashua	Hollis St. W. of Main St	11,070	2006-18	-0.9%	0.79
NH111 - Nashua	Hollis St. E. of Main St	10,000	2005-17	-2.2%	0.80
Nh111 - Hudson	E. of Library St	14,560	2004-16	-0.7%	0.81
Nh111 - Hudson	Windham T/L	16,530	2006-18	0.2%	0.83

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Existing Traffic Volumes and Trends, Volume-to-Capacity

<u>Highway</u>	<u>Location</u>	<u>Existing AWDT</u>	<u>Ct Trend Years</u>	<u>Annual % Change</u>	<u>Vol/Cap</u>
Main Street - Nashua	S. of Amherst St	21,550	2005-17	-3.0%	0.96
Main Street - Nashua	over Nashua River	23,730	2005-17	0.2%	0.79
Main Street - Nashua	N. of Hollis St	14,360	2006-15	-4.8%	0.48
Main Street - Nashua	S. of Hollis St	14,810	2005-17	-4.3%	0.49
NH3A - Hudson	Mass S/L	7,710	2005-17	-0.9%	0.46
NH3A - Hudson	S. of Rena St	23,580	2005-17	-2.4%	0.72
NH3A - Hudson	S. of Wason Rd	39,950	2005-17	0.5%	0.89
NH3A - Hudson	N. of Ledge Rd	26,330	2005-17	-0.8%	0.88
NH3A - Hudson	S. of Derry Lane	9,320	2005-17	0.4%	0.56
NH3A - Litchfield	Manchester C/L	12,680	2004-16	3.0%	0.75
NH38 - Pelham	Mass S/L	13,850	2006-18	0.5%	0.77
NH38 - Pelham	Salem, NH T/L	13,610	2005-17	0.2%	0.82
NH128 - Pelham	Mass S/L	10,400	2006-18	-1.1%	0.63
NH128 - Pelham	N. of Sherburne Rd	14,860	2006-18	0.6%	0.90
NH128 - Pelham	Windham T/L	5,620	2006-18	0.1%	0.34
DW Highway - Nashua	Mass S/L	18,880	2004-18	-1.4%	0.40
DW Highway - Nashua	S. of Sagamore Bridge	21,550	2003-18	-1.8%	0.68
US3/Henri Burke	W. of Manchester St	14,210	2004-16	-1.0%	0.79
DW Highway - Nashua	Merrimack T/L	12,490	2004-16	-2.2%	0.75
DW/US3 - Merrimack	N. of Manchester St	14,510	2004-16	-1.9%	0.48
DW/US3 - Merrimack	N. of Industrial Dr.	11,840	2004-16	-1.8%	0.39
DW/US3 - Merrimack	S. of Bedford Rd	14,750	2005-17	-0.6%	0.98
NH13 - Brookline	Mass S/L	7,310	2006-18	0.7%	0.44
NH13 - Milford	S. of NH101 bypass	12,370	2004-16	0.2%	0.73
NH13 - Milford	N. of NH101 bypass	5,480	2004-16	-1.7%	0.32
NH13 - Mont Vernon	Mont Vernon T/L	3,190	2006-16	-5.4%	0.19
NH31 - Mason	Mass S/L	2,570	2008-18	0.7%	0.15
NH31 - Wilton	S. of NH101	3,540	2004-16	-3.6%	0.21
NH31 - Wilton	downtown Wilton	2,780	2004-16	-0.9%	0.16
NH31 - Lyndeborough	Greenfield T/L	2,780	2006-18	-0.1%	0.16
NH122-Hollis	at Mass S/L	2,410	2006-18	0.8%	0.14
NH122-Hollis	at Amherst t/l	4,290	2006-18	-1.0%	0.25
NH122-Hollis	s. of Baboosic Lake Rd	8,050	2005-17	-0.3%	0.47
NH 102-Hudson	N. of Ferry St	15,750	2006-18	-2.0%	0.79
NH 102-Hudson	Hudson/Londonderry T/L	14,750	2006-17	-0.8%	0.89
NH 102-Hudson	Litchfield/Hudson T/L	16,900	2004-16	-0.1%	1.02

ROADWAY CONGESTION

As discussed in the Planning Emphasis Areas section, NRPC maintains a Congestion Management Process. The following are summary reports obtained from iterative travel time runs that show peak period speeds along roadway segments and Travel Time Reliability (TTR) ratios. For studies conducted via travel time runs, TTR provides a ratio of actual travel time to expected time (driving at the speed limit). Ratios greater than 1 indicate congestion forcing speeds under the limit; a TTR greater than 1.5 is indicative of unacceptable levels of delay.

NRPC is now migrating from the travel time run methodology to use of probe data, which will enable much larger sample sizes to be collected and, consequently, more valid travel times and reliability indicators.

F.E.E. Turnpike Congestion Report

Southbound	AM Peak				PM Peak		
	Length (miles)	TT (min)	Speed	TTR	TT (min)	Speed	TTR
Exit 13 to Exit 12	1.90	3.03	37.6	1.73	1.97	58.0	1.13
Exit 12 to Exit 11	3.80	4.23	53.9	1.21	4.10	55.6	1.17
Exit 11 to Exit 10	1.00	0.98	61.0	1.07	0.98	61.0	1.06
Exit 10 to Exit 8	1.70	1.57	65.1	0.99	1.57	65.1	0.96
Exit 8 to Exit 7	0.90	0.97	55.9	0.95	0.97	55.9	1.02
Exit 7 to Exit 5	1.90	1.75	65.1	0.77	1.75	65.1	0.77
Exit 5 to Exit 4	1.50	1.53	58.7	0.92	1.60	56.3	0.96
Exit 4 to Exit 1	1.60	1.68	57.0	0.98	1.73	55.4	1.01
Exit 1 to Mass SL	1.70	1.65	61.8	0.91	1.57	65.1	0.84
Northbound							
Exit 12 to Exit 13	1.90	1.75	65.1	0.88	1.75	65.1	0.92
Exit 11 to Exit 12	3.80	3.50	65.1	0.94	5.05	45.1	1.44
Exit 10 to Exit 11	1.30	1.20	65.0	1.00	2.85	27.4	2.38
Exit 8 to Exit 10	1.80	1.65	65.5	0.95	2.63	41.0	1.60
Exit 7 to Exit 8	0.90	1.00	54.0	1.05	0.98	54.9	0.96
Exit 5 to Exit 7	2.40	2.35	61.3	0.91	2.53	56.8	0.99
Exit 4 to Exit 5	1.80	1.68	64.2	0.86	1.67	64.8	0.86
Exit 2 to Exit 4	1.60	1.45	66.2	0.85	1.48	64.7	0.88
Mass SL to Exit 2	1.00	0.93	64.3	0.84	0.97	62.1	0.87

NH 101A & Canal/Bridge Streets Congestion Report

Eastbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Bypass west end to Milford Oval	2.86	5.30	32.4	1.08	5.78	29.7	1.18
Milford Oval to Bypass west end	1.94	3.88	30.0	1.04	4.32	27.0	1.16
Bypass west end to NH122	0.60	1.63	22.0	1.59	1.23	29.2	1.20
NH122 to Continental Blvd	3.55	6.47	32.9	1.19	7.12	29.9	1.32
Continental Blvd to Thornton Rd	1.43	3.23	26.5	1.51	3.80	22.6	1.77
Thornton Rd to Somerset Pkwy	0.85	1.53	33.3	1.20	1.70	30.0	1.33
Somerset Pkwy to Tnpk Exit 7	1.06	2.13	29.8	1.00	2.85	22.3	1.34
Tnpk Exit 7 to NH 130 Broad St	0.70	2.52	16.7	1.74	2.83	14.8	1.97
NH 130 to Main St.	0.70	2.37	17.7	1.79	2.58	16.3	1.95
Main St. to Canal St.	0.20	0.98	12.2	2.39	1.42	8.5	3.43
Canal St. to Taylor Falls Bridge	1.00	2.70	22.2	1.30	3.60	16.7	1.73
Westbound							
Taylor Falls Bridge to Main St.	1.20	3.67	19.6	1.54	5.10	14.1	2.14
Main St. to Library Hill	0.10	0.75	8.0	3.48	0.77	7.8	3.55
Library Hill to NH 130 Broad St	0.70	1.43	29.3	1.08	1.32	31.9	1.00
NH 130 to Tnpk Exit 7	0.70	1.32	31.9	0.92	1.43	29.3	0.99
Exit 7 to Somerset Pkwy	1.06	2.78	22.9	1.31	2.98	21.3	1.41
Somerset Pkwy to Thornton Rd	0.85	1.77	28.9	1.39	2.27	22.5	1.78
Thornton Rd to Continental Blvd	1.43	3.38	25.4	1.58	4.67	18.4	2.17
Continental Blvd to NH122	3.55	6.07	35.1	1.12	7.93	26.8	1.47
NH122 to Bypass west end	0.60	1.18	30.4	1.15	1.18	30.4	1.15
Bypass west end to Milford Oval	1.94	3.78	30.8	1.02	4.57	25.5	1.22
Milford Oval to Bypass west end	2.86	5.15	33.3	1.05	6.08	28.2	1.24

NH 101 Congestion Report

Eastbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Temple line to NH31 North	5.18	6.23	49.9	0.92	6.33	49.1	0.93
NH31 North to Bypass start	2.06	3.07	40.3	1.29	3.23	38.2	1.35
Bypass start to NH13	3.56	4.52	47.3	1.14	4.80	44.5	1.21
NH13 to NH101a exit	1.78	2.55	41.9	1.31	2.20	48.5	1.13
NH101a to Baboosic Lake Rd	2.97	3.22	55.4	0.90	3.12	57.2	0.88
Baboosic Lk Rd to H Greeley Rd	2.22	2.72	49.0	1.02	2.62	50.9	0.98
H Greeley Rd to Joppa Hill Rd	2.32	2.87	48.6	1.03	2.87	48.6	1.03
Westbound							
Joppa Hill Rd to H Greeley Rd	2.32	2.85	48.8	1.02	2.80	49.7	1.01
H Greeley Rd to Baboosic Lk Rd	2.22	2.62	50.9	0.98	2.62	50.9	0.98
Baboosic Lake Rd to NH101a	2.97	3.22	55.4	0.90	3.10	57.5	0.87
NH101a exit to NH13	1.89	1.88	60.2	0.91	1.85	61.3	0.89
NH13 to Bypass end	3.56	4.55	46.9	1.15	5.08	42.0	1.29
Bypass end to NH31 North	2.06	3.18	38.8	1.34	3.30	37.5	1.38
NH31 North to Temple line	5.18	6.23	49.9	0.92	6.47	48.1	0.95

NH 111 Congestion Report

Eastbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Mass line to Westgate	3.39	5.25	38.7	1.00	5.02	40.5	0.95
Westgate to Tnpk Exit 5	1.29	3.35	23.1	1.52	3.68	21.0	1.66
Tnpk Exit 5 to Main St	1.66	3.82	26.1	1.15	4.22	23.6	1.27
Main St to NH102	1.32	4.35	18.2	1.65	7.12	11.1	2.69
NH102 to Central St	1.85	4.68	23.7	1.27	7.15	15.5	1.93
Central St to Windham line	2.72	3.65	44.7	0.99	3.95	41.3	1.07
Westbound							
Windham line to Burnham Rd	2.72	4.07	40.1	1.10	4.88	33.4	1.32
Burnham Rd to NH102	1.86	4.35	25.7	1.17	4.50	24.8	1.21
NH102 to Main St	1.32	4.83	16.4	1.83	5.58	14.2	2.11
Main St to Tnpk Exit 5	1.66	4.18	23.8	1.26	4.50	22.1	1.35
Tnpk Exit 5 to Westgate	1.29	2.83	27.3	1.28	2.95	26.2	1.33
Westgate to Mass line	3.39	5.18	39.2	0.99	5.65	36.0	1.08

US 3 Daniel Webster Highway Congestion Report

Southbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Bedford TL to Bedford Rd.	2.20	3.52	37.5	0.96	4.23	31.2	1.16
Bedford Rd. to Baboosic Lake Rd	1.70	3.50	29.1	1.05	4.07	25.1	1.22
Baboosic Lake Rd to Greeley St	2.00	3.62	33.2	0.92	4.18	28.7	1.06
Greeley St to Industrial Dr	1.30	2.03	38.4	1.06	2.17	36.0	1.13
Industrial Dr to H Burque Hwy	2.70	4.03	40.2	1.01	4.50	36.0	1.13
Northbound							
Bedford Rd to Bedford TL	2.20	3.68	35.8	1.00	3.65	36.2	0.99
Baboosic Lake Rd to Bedford Rd	1.70	3.42	29.9	1.02	3.70	27.6	1.11
Greeley St to Baboosic Lake Rd	2.00	4.00	30.0	1.01	7.92	15.2	2.01
Industrial Blvd to Greeley St	1.30	2.08	37.4	1.08	3.77	20.7	1.96
H Burque Hwy to Industrial Blvd	2.70	3.97	40.8	1.00	3.83	42.3	0.96

Main Street Nashua Congestion Report

Southbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Amherst St to Factory St	0.29	2.25	7.7	3.27	1.43	12.1	2.07
Factory St to Hollis St	0.27	1.07	15.2	1.68	2.10	7.7	3.30
Hollis St to Lake St	0.37	1.82	12.2	2.06	1.47	15.1	1.66
Lake St to South Main St	1.00	2.53	23.7	1.24	2.58	23.2	1.26
Northbound							
Factory St to Amherst St	0.29	2.03	8.6	2.96	2.33	7.5	3.39
Hollis St to Factory St	0.27	1.58	10.2	2.48	1.17	13.9	1.83
Lake St to Hollis St	0.37	2.07	10.7	2.34	1.85	12.0	2.11
South Main St. to Lake St	1.00	2.85	21.1	1.39	3.08	19.5	1.50

NH 3A Hudson Congestion Management Report

Northbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Massachusetts S/L to Dracut Rd	1.58	2.83	33.5	1.20	3.02	31.4	1.27
Dracut Rd to Sagamore Bridge	0.78	1.25	37.4	0.93	1.57	29.9	1.18
Sagamore Bridge to Wason Rd	0.15	0.80	11.3	2.69	0.85	10.6	2.83
Wason Rd to Pelham Rd	1.25	2.43	30.8	0.98	3.83	19.6	1.53
Pelham Rd to County Rd	0.22	0.45	29.3	1.00	0.47	28.3	1.06
County Rd to Central St	0.34	1.90	10.7	2.78	2.22	9.2	3.26
Central St to Ferry St	0.41	1.50	16.4	1.83	2.20	11.2	2.68
Southbound							
Central St to County Rd	0.34	1.73	11.8	2.54	1.63	12.5	2.40
County Rd to Pelham Rd	0.22	0.53	24.8	1.23	0.47	28.3	1.04
Pelham Rd to Wason Rd	1.25	3.35	22.4	1.34	2.98	25.1	1.19
Wason Rd to Sagamore Bridge	0.15	0.83	10.8	2.81	1.20	7.5	4.00
Sagamore Bridge to Dracut Rd	0.78	1.43	32.7	1.07	1.65	28.4	1.23
Dracut Rd to Massachusetts S/L	1.58	2.60	36.5	1.10	2.50	37.9	1.06

NH 102 Hudson Congestion Management Report

Eastbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Ferry St to Elm Ave (3A)	0.97	2.95	19.7	1.52	3.03	19.2	1.56
Elm Ave (3A) to Page Rd	2.63	4.17	37.9	1.05	3.97	39.8	1.01
Page Rd to Londonderry TL	1.11	2.05	32.5	1.23	1.90	35.1	1.14
Londonderry TL to NH128	2.91	3.77	46.4	1.14	4.38	39.8	1.33
NH128 to I-93	2.00	3.88	30.9	1.10	4.93	24.3	1.40
Westbound							
I-93 to NH128	2.00	4.45	27.0	1.26	4.98	24.1	1.41
NH128 to Londonderry TL	2.91	3.33	52.4	1.01	3.73	46.8	1.13
Londonderry TL to Page Rd	1.11	1.72	38.8	1.03	1.88	35.4	1.13
Page Rd to Elm Ave (3A)	2.63	6.37	24.8	1.62	4.05	39.0	1.03
Elm Ave (3A) to Ferry St	1.01	3.10	19.5	1.53	2.57	23.6	1.27

NH 130 Congestion Management Report

Eastbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
NH122 to Roundabout	4.34	7.10	36.7	1.02	7.50	34.7	1.08
Roundabout to Dublin Ave	0.69	2.42	17.0	1.76	1.33	30.8	0.97
Dublin Ave to Nashua Mall	0.65	1.52	25.6	1.18	1.33	29.1	1.03
Nashua Mall to Broad St Pkwy	0.46	1.45	19.0	1.57	2.03	13.6	2.21
Broad St Pkwy to Amherst St	0.46	1.93	14.3	2.10	2.92	9.5	3.17
Westbound							
Amherst St to Broad St Pkwy	0.46	1.05	26.3	1.14	1.22	22.7	1.33
Broad St Pkwy to Nashua Mall	0.46	1.97	14.0	2.14	2.67	10.3	2.90
Nashua Mall to Dublin Ave	0.64	1.00	38.4	0.77	1.65	23.3	1.28
Dublin Ave to Roundabout	0.68	2.30	17.7	1.69	1.28	31.8	0.95
Roundabout to NH122	4.34	7.20	36.2	1.04	6.90	37.7	0.99

NH 38 Congestion Management Report

Northbound	Length (miles)	AM Peak			PM Peak		
		TT (min)	Speed	TTR	TT (min)	Speed	TTR
Old Gage Hill Rd to Salem line	0.99	1.42	41.9	0.96	1.45	41.0	0.98
Main St to Old Gage Hill Rd	2.25	3.12	43.3	1.09	3.15	42.9	1.09
Willow St to Main St	1.07	1.95	32.9	1.06	2.10	30.6	1.14
Massachusetts line to Willow St	1.45	2.03	42.8	0.82	2.20	39.5	0.88
Southbound							
Salem line to Old Gage Hill Rd	0.99	1.30	45.7	0.87	1.38	42.9	0.93
Old Gage Hill Rd to Main St	2.25	3.38	39.9	1.18	3.43	39.3	1.19
Main St to Willow St	1.07	2.03	31.6	1.11	2.23	28.7	1.21
Willow St to Massachusetts line	1.45	2.17	40.1	0.87	2.15	40.5	0.86

FREIGHT MOVEMENT

The FAST Act includes several provisions to improve the condition and performance of the national freight network and to support investment in freight-related surface transportation projects. The legislation establishes a national policy of maintaining and improving the condition and performance of the National Multimodal Freight Network to ensure that the Network provides a foundation for the U.S. to compete in the global economy. The FAST Act specifies goals associated with this national policy related to the condition, safety, security, efficiency, productivity, resiliency, and reliability of the Network, and also to reduce the adverse environmental impacts of freight movement on the Network. These goals are to be pursued in a manner that is not burdensome to State and local governments. [49 U.S.C. 70101]

The NRPC region has a total population of more than 200,000 residents and consists of 13 member municipalities. According the NHDOT Long Range Transportation Plan (LRTP) 2010 – 2030, freight movement via trucks and highways is forecasted to increase by 80% over the next 20 years. This will likely result in increased wear and tear on roads, truck-related traffic congestion, and create safety concerns on roads. This provides an opportunity to invest in rail corridors and freight intermodal facilities to minimize bulk freight traveling long distances by highways. Additionally, the LRTP states that the business models in the State are increasingly relying on “Just-in-time” delivery for raw and goods movements. This shows the need to improve reliability of shipping and be prepared for the increased demand for individual shipping. The LRTP also states that much of the rail network in the State cannot support moderate to high-speed rail operations. This provides an opportunity to invest in rail freight infrastructure to improve competitiveness of rail freight network in New Hampshire reducing dependency on truck freight¹

NRPC's goals with regard to freight planning in the region are:

- Develop a regional database of truck volumes on roadways, trip generation from major activity centers and travel patterns.
- Work with other MPOs, including those in Massachusetts, to conduct coordinated data collection and freight planning tasks.
- Continue to work with NHDOT on the planning needs for the National Freight System and assist in the collection of data and analysis of data to support that system.
- Provide technical assistance to NHDOT for the maintenance and update of the State Freight Plan.

Road Network in Nashua Region

Freight movement within the NRPC region is mainly via trucks on highways. Roadways for freight goods within the region are generally wide enough to accommodate trucking vehicles with few exceptions where the road narrows.²

¹ Best Practices in Freight Planning, Final Report June 2017; Prepared for Nashua Regional Planning Commission. Prepared by AECOM Technical Services, Inc.

² *ibid*

The primary north/south arterial in the Nashua region is the F.E. Everett Turnpike (US 3), which is 45-mile long and runs from the Massachusetts State Line northward, through Nashua and Merrimack, and exits the region at the Merrimack/Bedford border. The region is also served by several other key north/south routes, including Daniel Webster Highway, NH 3A, NH 102, NH 38, NH 128, NH 122, and NH 13.

The primary east/west arterial serving the Nashua region is NH101A, which is located to the west of the Merrimack River. It runs east from Milford to downtown Nashua where it ends at the intersection of Main Street. NH101A serves as both a travel and retail corridor with heavy development in Nashua, Merrimack and Amherst. Other key east/west routes in the Nashua region include NH 101, NH 130, and NH 111.

In the Nashua region, the F.E. Everett Turnpike (US 3), NH Route 101, NH 101A, and portions of NH 102, NH 111 and NH 3A are part of the National Highway System (NHS). NH 102, NH 111 and NH 3A are Principal Arterials and were included by FHWA in the NHS as part of MAP-21. Roadways that are located on a Federal-aid Highway or that are designated as being part of the NHS are eligible for federal funds.

Freight Railroads in the Nashua Region

There are two freight railroad lines operating in the Nashua Region: the New Hampshire Main Line and Hillsborough Line.

The New Hampshire Main Line is 39-mile long and runs in New Hampshire through Nashua, Manchester and Concord. The line is owned and operated by Pan Am Railways. The line is maintained to FRA Class 3 from Nashua to Manchester, Class 2 between Manchester and Bow, and Class 1 between Bow and Concord. According to the Federal Railroad Administration (FRA), the maximum allowable operating speeds are 10 mph on Class 1, 25 mph on Class 2, and 40 mph for Class 3 freight trains. There are 11 bridges and 23 grade crossings along the line. Pan Am Railways, operating from the Massachusetts state line to Bow, delivers unit coal trains and local freight to Nashua, Merrimack, Manchester, and Concord.

The Hillsboro Branch from Nashua to Wilton is 12-mile long and owned and operated by Pan Am Railways. This section of the branch, known by PAR as the Hillsboro Running Track, passes over eight bridges and 36 grade crossings and is categorized as FRA Excepted, which means that no passenger trains are permitted to operate along the line and there are limitations on hazardous material that can be transported over the line. According to the FRA, the maximum allowable operating speed on Excepted Track is 10 mph for freight trains³ The Milford-Bennington railroad operates freight service along the Hillsboro Branch between the Granite State Concrete batching facility in west Milford and the Granite State Concrete quarry in Wilton.

Intermodal Facilities in New Hampshire

According to the 2012 NH State Rail Plan, goods in New Hampshire are generally transferred between rail freight and trucks. Transfer of freight between modes require intermodal connections. However, there are no intermodal facilities within New Hampshire. There are three key intermodal facilities located within 100 miles (Worcester and Ayer, MA and Auburn, Maine) and two regional facilities within 250 miles (Mechanicville, NY and Montreal, PQ). The direct intermodal service from these terminals are entirely to points outside of the Northeast and since most of the truck shipments from New Hampshire

³ ibid

are to locations within the Northeast or within 250 miles, the potential for significant shipments to move via intermodal service is limited. The regional facilities are however important for long-distance shipments⁴.

Commodity Flow

The New Hampshire statewide rail system is grouped into four regions: North Country, Connecticut River Valley, Southern New Hampshire, and Seacoast. Freight rail lines in the Southern New Hampshire region provide service to Nashua region. According to the 2012 NH State Rail Plan⁵, the Southern New Hampshire region currently receives three quarters of all freight shipped into New Hampshire by rail, based on weight. Goods movement in the region is primarily dominated by coal for electric generation at Bow. Clay, concrete, glass, and stone also comprise much of the freight moving into this area, based on weight. Other products shipped to this area include farm products, lumber and wood products, food, chemical products, and some nonmetallic minerals. Most of the freight rail movements into this area travel inbound to the region. The small amount of outbound freight rail traffic is categorized by shippers as miscellaneous freight.

Critical Urban Freight Corridors

The New Hampshire Department of Transportation (NHDOT) requested that all regional planning agencies/metropolitan planning organizations (MPOs) in the state recommend roadways within their regions as designated Critical Urban Freight Corridors (CUFCs) and Critical Rural Freight Corridors (CRFCs). Those selected by NHDOT will be incorporated into the National Highway Freight Network (NHFN) and be eligible for federal funding that specifically supports the roadway freight system.

NRPC has considered the following factors in developing its recommendations for nominating critical freight corridors:

- Truck volume reported by NHDOT along corridor segments;
- Corridor function for long-distance freight hauling;
- Corridors with ongoing improvement projects;
- Submitting total corridor mileage that is commensurate with an appropriate MPO share of the State's allocated 75 CUFC miles.

The total recommended CUFC mileage is 28.64; CRFC mileage totals 4.55.

The corridors recommended by NRPC staff for inclusion in the CUFC/CRFC network were reviewed by the NRPC Transportation Technical Advisory Committee (TTAC) at its June 13, 2018 meeting. The TTAC approved the list with one addition, continuing the designation of NH 101 as a CUFC from Wilton Rd. in Milford to NH 31 in Wilton. The TTAC concurred with staff that NH 101A should be designated as the highest priority CUFC. At its Commission meeting of June 20, 2018, the Nashua MPO reviewed the recommended plan and accepted the TTAC recommendation without a formal vote.

⁴ ibid

⁵ NHDOT. 2012 New Hampshire State Rail Plan. June 2012.

<https://www.nh.gov/dot/org/aerorailtransit/railandtransit/documents/FinalStateRailPlan.pdf>

NH DOT Statewide Freight Plan

To receive funding under the National Highway Freight Program (23 U.S.C. 167), the FAST Act requires each State to develop a State freight plan, which must comprehensively address the State's freight planning activities and investments (both immediate and long-range).

The New Hampshire DOT (NH DOT) Statewide Freight Plan is under development. It will be a strategic planning document that will define a short and long-term vision for the freight system in New Hampshire. The statewide freight plan will be multi-modal; including air, pipeline, rail, truck and maritime transport.

NRPC is participating in the development of the statewide plan and will incorporate its findings and recommendations into the appropriate regional planning documents and practices.

Best Practices for the Nashua Region

NRPC retained AECOM Technical Services, Inc. to research regional and statewide conditions and to develop a set of recommendations for best practices in freight planning for the region. A review of existing plans and studies for the NRPC region and the State of New Hampshire shows that there is a lack of freight transportation data and information for the NRPC region. Based on the existing conditions, review of best practices, and goals of national multimodal freight policies, the following recommendations were provided for the Nashua Region:

1. Establish a regional freight advisory committee consisting of public and private stakeholders.
2. Identify key trading partners, shippers/receivers, distributors, transportation service providers (trucking companies) etc.
3. Organize regional freight forums with public sector planning and economic development officials and private sector stakeholders, including several of the State's major shippers and receivers, motor carriers and railroads to discuss economic development opportunities, freight needs and deficiencies and potential improvement strategies as well as to learn about new and emerging issues.
4. Conduct an inventory of freight transportation system and infrastructure, including:
 - a. Major truck routes and truck utilization data
 - b. Active and abandoned freight railroads
 - c. Conditions of truck routes and freight railroads
 - d. Bridge capacity
 - e. Capacity and vertical clearance of freight railroads
 - f. At-grade railroad crossings
5. Identify intermodal connectors, which are short roadway segments that connect rail terminal facilities to the NHS.
6. Identify the types of services such as bulk services, intermodal services, and carload services offered by freight railroads.
7. Identify intermodal terminals in or near the region where goods are transferred from one mode to another.
8. Conduct a goods movement study for the region to:
 - a. Understand the types of commodities that are being moved inside, outside and through the region
 - b. Identify transportation modes used to move these commodities

- c. Identify origins and destinations of freight in the region
9. Explore Intelligent Transportation Systems (ITS) to improve safety, efficiency and reliability of freight transportation and advanced technologies for truck productivity.

Additionally, the *2012 NH State Rail Plan*⁶ has identified several recommendations that are related to the freight railroads in the NRPC region. It is recommended that the NRPC region work with public agencies and private stakeholders to address or implement these recommendations:

1. Work with the State of Massachusetts to raise the weight limits on MBTA-owned lines in Massachusetts that serve New Hampshire (the New Hampshire Main Line from North Chelmsford to Nashua),
2. Identify and plan for freight distribution centers along rail lines,
3. Support grant funding for improving the primary and secondary branch line segments of the Pam Am Railways New Hampshire Main Line (from Nashua to Concord). Limited train speeds on this line due to current track conditions have resulted in reduced services to the Nashua, Manchester and Concord areas. Additionally, this improvement would also support the viability of an intermodal container site in the Nashua/Manchester area,
4. Initiate a program to provide financial support in partnership with shippers/railroads for infrastructure improvements that increase rail access,
5. Continue policy of acquiring abandoned rail lines with potential for future use.
6. Ensure that state-owned abandoned rail rights-of-way are available for future railroad use

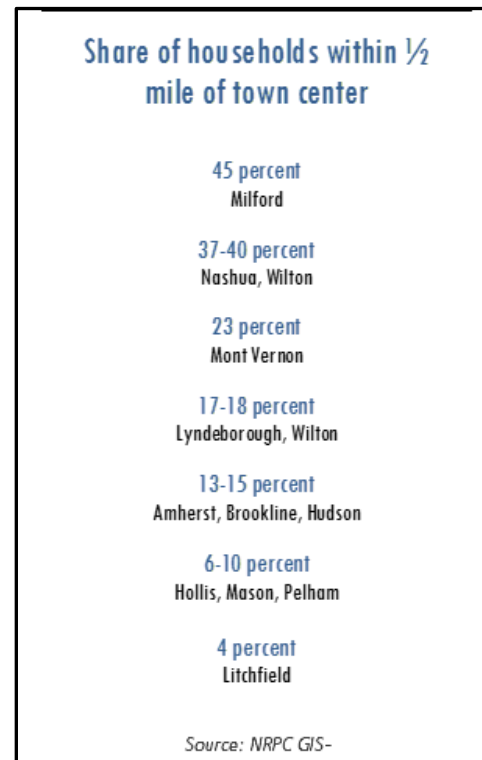
⁶ NHDOT. 2012 New Hampshire State Rail Plan. June 2012.
<https://www.nh.gov/dot/org/aerorailtransit/railandtransit/documents/FinalStateRailPlan.pdf>

BICYCLE AND PEDESTRIAN PLANNING

Pedestrian and bicycle infrastructure are improving in the region, but motorized travel continues to dominate the transportation network. While motor vehicles provide an indispensable component of our transportation system, travel by foot and bicycle are also essential elements. These modes of travel are efficient, affordable, healthy and environmentally sound, and their increased usage will provide more transportation choices, a more complete local and regional transportation system, and contribute to more vibrant and attractive communities.

There are, in fact, very walkable areas throughout the region that are providing a strong foundation for the expansion of pedestrian- and bicycle-friendly infrastructure and development. In Milford, 45 percent of the town's population lives within a half-mile of the downtown, followed by Wilton (40 percent) and Nashua (37 percent). Sidewalk networks in all three areas are well developed. Across the whole of the region, 28 percent of residents and 27 percent of jobs are located within a half mile of downtowns or town centers.

The priority of the Nashua MPO is to encourage a shift from motorized to non-motorized travel. The idea is to substitute bicycling and walking for driving an automobile for personal errands, as well as for visiting friends and the commute to work, whenever possible. Research has shown that where investment in pedestrian and bicycle facilities has occurred, rates of non-motorized travel are significantly higher than the national average. It is therefore reasonable to assume that some percentage of personal trips now being conducted via motor vehicle in the region could be shifted to non-motorized modes if proper facilities and encouragement were provided.



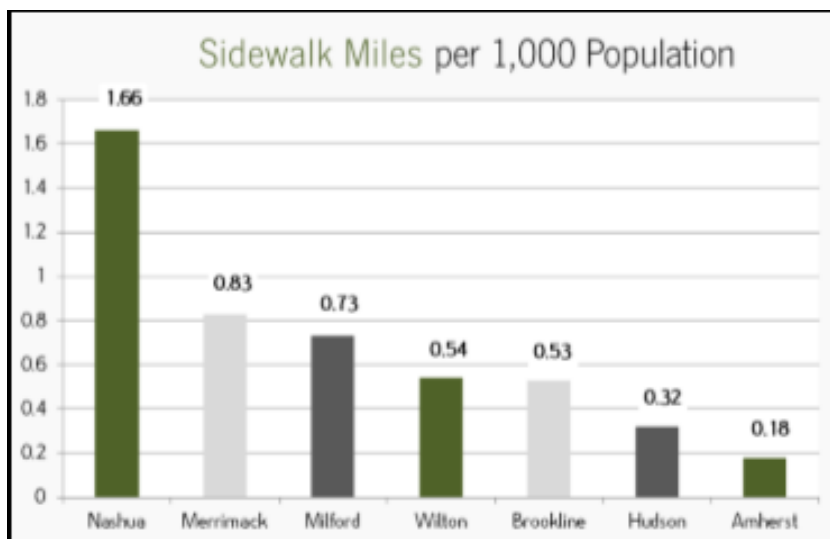
The 2015 NRPC Regional Pedestrian and Bicycle Plan ([insert link to plan](#)) builds off goals and objectives outlined in the 2005 Regional Bicycle and Pedestrian Plan and the 2014 Nashua Regional Plan. These plans explain the benefits of a shift to bicycling and walking and they identify a regional strategy for increasing non-motorized travel in the Nashua region. The guiding principles of these planning efforts are as follows:

- Focus on local, short-distance trips which are the trips most likely to be conducted on foot or on a bike;
- Provide municipal policymakers and community advocates with the tools for improving their local bicycle and pedestrian environments;
- Provide the framework for a regional bicycle network that includes major travel corridors through the region and sub-regional connections to local non-motorized networks; and
- Provide pedestrian connections to public transit networks where possible.

Existing Sidewalks, Bike Lanes & Trails

While there remain significant gaps and stress points in the local and regional pedestrian-bicycle network, several municipalities in the region have undertaken efforts to improve bicycle and pedestrian amenities in recent years.

The City of Nashua continues to improve downtown sidewalks and to expand its Riverwalk along the Nashua River. The Heritage Rail Trail connects neighborhoods to Main Street and Mine Falls Park and a recent CMAQ grant will fund an eastward extension of the trail. Bike racks on city buses have expanded the range of the Nashua Transit System and increased access for people who depend on the combination of walking, biking and public transit



to get to their destinations. The City recently implemented a dock less bikeshare system which is expected to provide the “first and last mile” of travel for transit users. The 200 bikes that are being distributed around the City are also expected to increase the public’s awareness that bicycles are an acceptable mode of transportation, which will in turn encourage additional usage of the bikeshare system as well as privately owned bicycles. Additionally, the bikeshare system is owned and operated by a private company and it costs the City virtually nothing to operate.

The Town of Brookline uses its Sidewalk and Trails Connectivity Plan to guide additions to its fast expanding sidewalk and trail system. In Amherst, a Safe Routes to School planning project lead to a focus on improving pedestrian conditions in areas surrounding the elementary schools and in the village center as well as near the middle school. More recently, a local committee is collaborating with town officials to develop a comprehensive bicycle and pedestrian plan for the community (a planning meeting during this process attracted over 100 people to town hall). The Town of Milford, already a walkable community with many sidewalks and two bike/pedestrian bridges spanning the Souhegan River, recently completed a town-wide bicycle and pedestrian master plan that promises to further improve conditions.

The Town of Merrimack has a sidewalk and trail plan for its town center (insert link to map), as well as a Safe Routes to School travel plan for its elementary school. A Transportation Alternatives Program (TAP) grant will help fund a path under the Daniel Webster Highway that will provide a connection between Watson Park on the east side with a trail system on the west side. The town is also actively seeking funding to complete sidewalks that will connect the town center with nearby neighborhoods. Additionally, NRPC will complete a bicycle and pedestrian corridor plan for the Daniel Webster Highway corridor in late 2018 (insert link to map).

Wilton officials used a Federal Transportation Enhancements (TE) grant to rebuild downtown sidewalks in

2007. The project included sidewalks and crosswalk improvements, traffic calming and upgrading a vacant lot that is now used for a farmer's market and other community events. More recently, NRPC worked with the town to complete a Safe Routes to School travel plan for the elementary and middle schools.

Litchfield's Albuquerque Avenue gently winds on a north-south axis through the center of Town. Funding was secured in 2007 to construct an eight-foot-wide pedestrian path/bikeway along this two-mile corridor. Since its completion in 2010 the Albuquerque Bike-Pedestrian Path has become a valuable and heavily utilized community asset.

Bicycling and Walking Trends

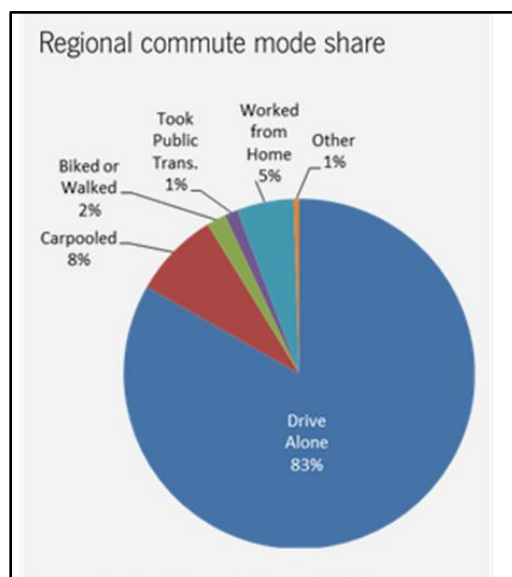
The U. S. Department of Transportation (USDOT) initiated an effort in 1969 to collect detailed data on personal travel. The 1969 survey was the first Nationwide Personal Transportation Survey (NPTS). The survey was conducted again in 1977, 1983, 1990, and 1995. In 2001, the survey was expanded by integrating the Federal Highway Administration (FHWA) managed NPTS and the Bureau of Transportation Statistics-sponsored American Travel Survey (ATS), and the survey was re-named the National Household Travel Survey (NHTS).

The 2017 NHTS asked respondents how they 'usually' commute to work. It can be seen in the table that nationally around 4% of the population walk or bike to work⁷

The American Community Survey (2008-2013) suggests the combined rate of biking and walking to work in the Nashua region is about 2% (half the national rate).

The League of American Bicyclists (LAB) published Where We Ride: analysis of bicycle commuting in American cities, which is a report of 2016 American Community Survey data⁸. The document provides a more detailed breakdown of bicycle commuting by state which allows for a comparison of how New Hampshire compares with other states. The table on the right shows that while New Hampshire is the lowest ranked New England

National "Usual" Commute Mode	On Travel Day Commuted by:					
	Drove Alone	Shared Ride	Transit	Walk	Bike	Usual Mode
Drove Alone	86.2%	12.8%	0.2%	0.6%	0.1%	76.2%
Shared Ride	37.2%	60.2%	1.0%	1.2%	0.2%	11.0%
Transit	4.8%	14.4%	70.8%	7.0%	0.8%	6.9%
Walk	7.3%	18.2%	2.6%	69.8%	0.9%	2.9%
Bike	8.1%	11.9%	3.4%	4.6%	70.3%	1.1%
Actual Mode Share	71.0%	18.8%	5.2%	3.3%	1.0%	



Ranking by Mode Share			
State	Rank	Total Commute by Bike 2006	Total Commute by Bike 2016
Massachusetts	8	0.5	0.9
Vermont	17	0.5	0.6
Maine	27	0.4	0.4
Rhode Island	33	0.2	0.3
Connecticut	35	0.3	0.3
New Hampshire	38	0.2	0.3

⁷ National Household Transportation Survey, 2017

⁸ League of American Bicyclists: Where we Ride; analysis of bicycle commuting in American cities, 2016.

state for bicycle commuters (rounded), we did see a slight increase in the percentage of bicycle commuters in 2016.

Bicycle & Pedestrian Count Data

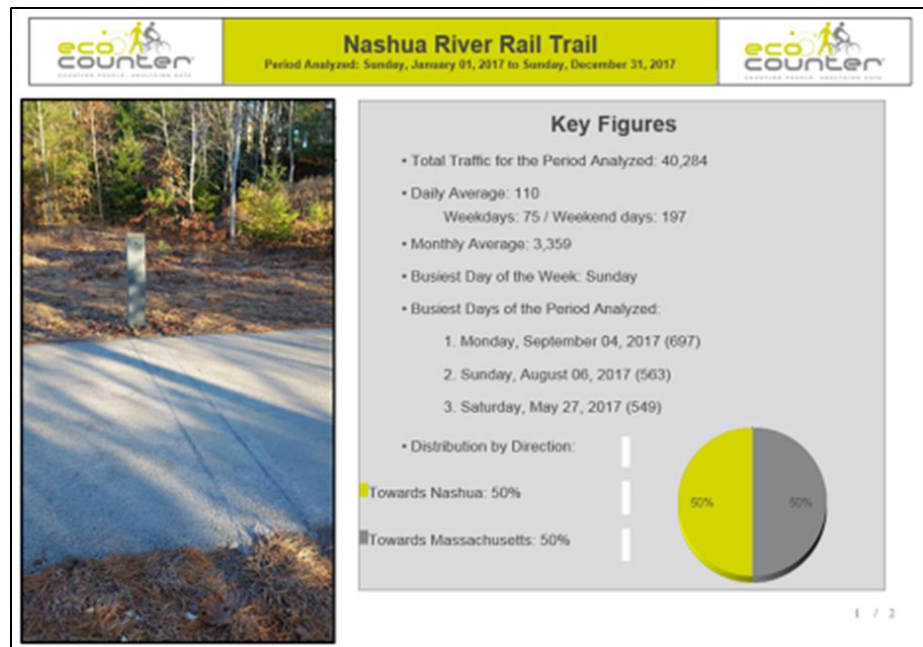
Biking and walking seem to be increasing as modes of transportation and recreation in the Nashua region. However, a major challenge in supporting these modes is a lack of data. Without data about biking and walking it remains difficult to justify and target infrastructure investments, plan for future biking and walking growth and illustrate the benefits of past bike-ped infrastructure improvements.

Without data, it also remains challenging to integrate bicycle and pedestrian travel into regional planning, decision making, and transportation modeling. The lack of data makes it easy to overlook the non-auto use of roadways.

Efforts are currently underway to collect bicycle and pedestrian data in a meaningful and consistent way across New Hampshire. A pilot program in 2015 defined counting protocols and scheduling of counts. Automatic counting machines have been purchased and are shared by regional planning commissions throughout the state.

In the meantime, the NH Department of Transportation, upon the recommendation of its Complete Streets Technical Advisory Committee (CSTAC), purchased bicycle GIS data from the company STRAVA, which utilizes GPS tracking technology on smart phones to map users bicycle routes.

NRPC maintains a permanent bicycle/pedestrian counter on the Nashua River Rail Trail near the Massachusetts border. The data from this counter shows significant usage of the trail (insert link to summary). The commission also owns several portable automatic counters that are being used to develop baseline data for the region. NRPC is working to develop a more robust bicycle and pedestrian counting program.



Level of Bicycle and Pedestrian Traffic Stress

Bicyclists and pedestrians choose their routes based on their perceived level of traffic stress. The level of traffic stress on a road segment depends on characteristics that include traffic volume, speed, road width and other factors. A low level of traffic stress can be achieved in mixed traffic on local streets with low traffic speeds. As the number of lanes, traffic speed and traffic volume increase, providing a low level of

stress requires progressively more protective measures – dedicated bike lanes, or sidewalks for walkers, and ultimately, physically segregated bikeways.

To measure walkability and bikability roadway segments are assigned a Level of Traffic Stress (LTS) for bicycling and a Level of Walkability (LoW) for pedestrian travel. This methodology for Level of Traffic Stress has been used in a handful of larger metropolitan areas across the U.S and recently, several communities in New Hampshire, including Nashua, have developed a network of LTS scores through a NHDOT pilot project. LTS is intended to analyze the comfort of bicyclists with varying experience levels depending on the physical characteristics of a street. The scores range from 1 (suitable for all bicyclists, including children) to 4 (suitable for only the most fearless and experienced rider), and are determined by a formula that incorporates bike lanes, shoulders, lane width, traffic speed, on-street parking, and other attributes.

For pedestrians, a separate formula is used that has some similarities to LTS, using attributes such as the presence of sidewalks, any buffer area between a sidewalk and the street, shoulder width, and traffic speed. Walkability scores also range from 1 to 4 but are meant to be more of a relative index than representative of specific levels of ability like the bicycle LTS system.

Once LTS and LoW scores have been determined surface treatments can be considered for roadway segments with low scores. Complete Streets design guidelines (described elsewhere in this document) can then be used to identify appropriate treatments.

NRPC has used this methodology as part of the planning process on projects in Nashua ([insert link to Plan for Health](#)) and Merrimack. The MPO is also participating in a statewide research project with NHDOT and Plymouth State University to further refine the Level of Bicycle stress methodology.

REGIONAL TRANSIT SERVICE

NASHUA TRANSIT SYSTEM

Fixed Route Service

The Nashua Transit System (NTS) is the only public transit provider based and operated within the Nashua Region. NTS currently operates ten permanent fixed transit routes which run weekdays between the hours of 6:15 a.m. and 6:45 p.m. and three weekday evening (6:45pm - 10:45pm) fixed routes within the City of Nashua. NTS also operates eight daytime Saturday (9:00am – 5:15pm) fixed routes and three Saturday evening (5:45pm – 9:45pm) fixed routes. The system does not operate on Sundays.

All routes offer one-hour service frequencies, except Routes 6 and 2, which serve the Route 101A and Daniel Webster Highway corridors, and offer ½ hour service frequencies due to heavy demand on the busy and largely commercial corridors via their Routes 2A and 6A services. All routes offer connections to the Nashua Transit Center.

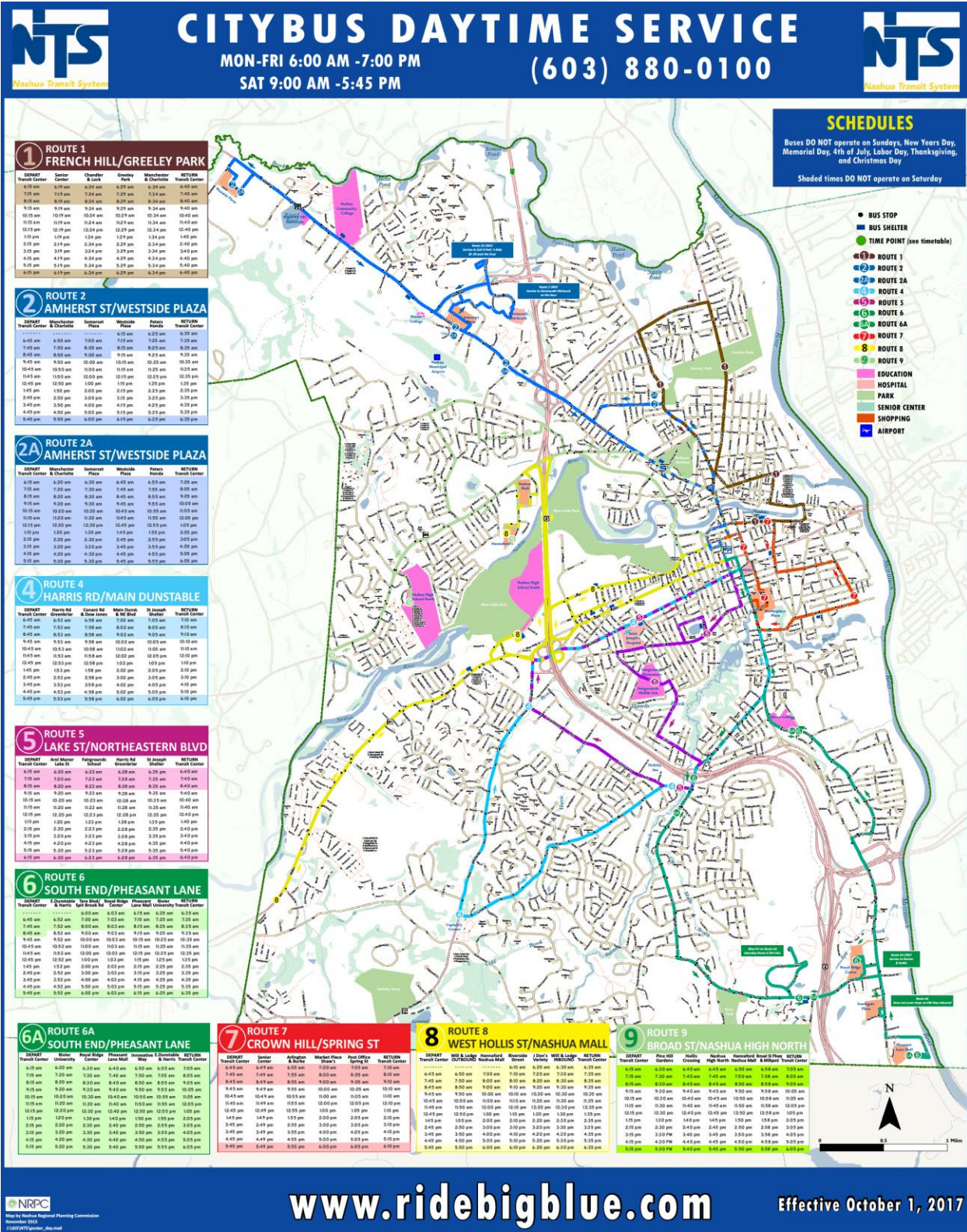
NTS operates a fleet of 10 buses, 3 trolleys, and 9 paratransit vans, all of which are 100% ADA accessible. All NTS vehicles are equipped with front side exterior bike racks allowing bicycle riders to utilize the service with minimal disruption. The City of Nashua has continued efforts to retrofit its fleet of city vehicles that are powered by Compressed Natural Gas (CNG). NTS currently operates eight CNG-fueled buses. The city operates a 600-gallon CNG fueling facility at its NTS Operations/Department of Public Works facility on Riverside Drive. The facility was expanded in 2014 from 300 gallons and is currently one of the largest such facilities operational in New England.

Paratransit Service

NTS provides paratransit services to Nashua residents with disabilities via its City Lift service. City Lift is a paratransit service for seniors 65 years old and older and riders certified as disabled according to the Americans with Disabilities Act of 1990 (ADA). The legislation requires transit providers to offer complementary paratransit service to areas located within ¾ of a mile of fixed-route transit routes. City Lift services are offered on the same schedule as the fixed route service within the City and limited services are available in the neighboring towns of Merrimack and Hudson. Those wishing to utilize the service must fill out an application and schedule an in-person review with the Nashua Transit System to ensure applicants meet qualifications. Additionally, NTS has annual UPASS contracts with a local university and community college.

Nashua Transit System Ridership			
FY17			
DAYTIME SERVICE - WEEKDAY			
Route 1			21,349
Route 2			52,002
Route 2A			50,678
Route 4			17,939
Route 5			30,638
Route 6			58,829
Route 6A			52,195
Route 7			27,291
Route 8			31,382
Route 9			27,985
Total Daytime - Weekday			370,288
EVENING SERVICE - WEEKDAY			
NORTH			10,750
CENTRAL			4,287
SOUTH			15,340
Total Evening - Weekday			30,377
DAYTIME SERVICE - SATURDAY			
Route 1			2,492
Route 2			7,761
Route 4			1,804
Route 5			2,901
Route 6			12,674
Route 7			3,281
Route 8			3,779
Route 9			2,624
Total Daytime - SATURDAY			37,316
EVENING SERVICE - SATURDAY			
NORTH			2,784
CENTRAL			1,137
SOUTH			4,321
Total Evening - Saturday			8,242
TOTAL RIDERSHIP			446,223
Source: Nashua Transit System			

2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects



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Effective October 1, 2017

Transit Ridership Trends

The Congressional Research Service reports that despite significant investments in public transportation at the federal, state, and local levels, transit ridership has fallen recently in many of the top 50 transit markets. It is generally understood (according to the report) that factors which have impacted public transportation ridership are competitive factors such as the drop in the price of gasoline over the past few years and the growing popularity of bikeshare and ride sourcing services such as Lyft and Uber. Locally, whereas NTS fixed route ridership approximately doubled between 1995 and 2015, it has more recently declined, reflecting this national trend.

An analysis of NTS ridership patterns indicates that ridership is heaviest surrounding major commercial destinations, particularly along Route 101A, the Daniel Webster Highway and the retail centers located along Broad Street at Exit 6. Routes 2, 2A, 6, and 6A, which serve the Route 101A and Daniel Webster Highway corridors account for approximately 52 percent of all NTS ridership.

Weekday (M-F) daytime service (approximately 6:15am-6:15pm) accounts for 83% of total system ridership. Saturday service (approximately 9:00am-9:45pm) accounts for 10% of total system ridership. Weekday (M-F) evening (approximately 6:45pm-10:45pm) accounts for 7% of total system ridership.

The number of people getting on and off buses at specific bus stops is highest at the Nashua Transit Center where all routes converge and transfers are most accessible. The Transit Center accounted for approximately 44 percent of all boardings and alightings in FY17. The Pheasant Lane Mall, Somerset Plaza, Nashua Mall, Royal Ridge Center and Westside Plaza, all among the largest commercial centers in the region, accounted for the highest ridership of all stops in the system other than the Transit Center. The high level of ridership at Westgate Plaza, on the far western edge of the Nashua city boundaries, suggests that some riders may be using the stop and then walking to access destinations to the west, as the Route 101A corridor accommodates several large commercial centers in the communities of Amherst and Merrimack currently unserved by transit, including a Walmart Super Center, which riders have consistently expressed interest in accessing via transit. NTS began a pilot bus route to Walmart in 2017 to gather information about meeting this need. NTS successfully applied for Federal Congestion Mitigation and Air Quality (CMAQ) funding to continue this pilot.

NASHUA TRANSIT SYSTEM RIDERSHIP

	6 to 9AM	9 AM to 3 PM	3 PM to 6 PM	6 PM to 10 PM	Daily	% Total
Route 1	22	41	18		81	5.3%
Route 2	50	103	43		196	13.0%
Route 2A	60	106	25		191	12.7%
Route 4	17	35	16		68	4.5%
Route 5	36	60	20		116	7.7%
Route 6	46	114	61		222	14.7%
Route 6A	61	106	30		197	13.1%
Route 7	18	61	24		103	6.8%
Route 8	27	63	28		118	7.9%
Route 9	29	57	16		102	6.7%
North End Nt				41	41	2.7%
Central Nt				15	15	1.0%
South End Nt				58	58	3.8%
Total	366	745	282	114	1,507	

Nashua Transit System – 2018 On Board Survey

During the Spring of 2018 an on-board survey was administered on all runs for each NTS fixed routes. The survey purpose was to obtain information on rider demographics and travel characteristics, as well as future desired service extensions. The information is now being utilized to inform the ongoing NTS Transit Extension Feasibility Study. Key findings of the on-board survey are summarized below:

Trip frequency – Over 80% ride NTS at least 3 days/week and 54% ride 5+ days/week. Only 8% are infrequent riders, twice a month or less often.

Reasons for riding – NTS is the only mode available for 60% of riders. Of the remainder of riders, convenience was cited by 29% and cost by 21%. Avoiding traffic congestion, parking cost/availability and preservation of environment were insignificant factors at 3% or less for each reason. Only 15% of riders reported having a motor vehicle available for the trip. Other modes used by transit riders include walking (55%), getting a ride from family or friend (43%), using a taxi or other ride service (30%), bicycling (11%) and driving themselves (7%). These data indicate a very high degree of transit dependency and importance of fixed route service to the NTS clientele.

Rider Profile – While fixed-route services are often thought to serve primarily senior and disabled persons, NTS has a varied rider profile. Only 9% of respondents are 65 and older, with 27% falling into the 50-64 range, 20% are 35 to 49, 26% are 25 to 34 and 17% are 16 to 24. Over two-thirds are employed (41% full-time, 27% part time). Retired persons account for 14% of riders, followed by unemployed/disabled (11%) and students (8%). Disabled persons make up 25% of all riders.

Just over 50% of riders reported household income under \$20,000 and there has been a significant reduction in income levels from those reported in previous surveys going back to 1988. Another 23% are in the \$20k-\$30k range and 13% are between \$30k-\$40k. Two-thirds (67%) of riders identified themselves as White, 19% Hispanic, 8% African American, 3% Asian and 3% Native American.

Transit Trip Characteristics – Nearly all riders (97%) walk from home to their bus stop and 95% walk to their activity destination (3% are picked up and driven to the destination). A walk time from home of 5 minutes or less is reported by 61% of riders, 25% walk 6 to 10 minutes, 12% walk 11 to 15 minutes and only 2% walk 16 minutes or more (20 min. maximum). For walk times from leaving the bus to their destinations, 82% of riders reported 1 to 5 minutes, 11% said 6 to 10 minutes and 7% walk 15 or more minutes.

Work trips constituted 49% of the total, followed by shopping (27%), medical (8%), school (7%) and social/personal (5%).

Desired Service Area Extensions – As the NTS Feasibility Study has a defined work scope for evaluating potential service area extensions to Merrimack, Hudson and Milford, transit riders were asked to identify desired destinations within these communities. The following table summarizes responses and indicates that service to Walmart in Amherst and Hudson is the most desired service extension. Just over one-third also report Boston-Manchester Airport as an important destination to serve.

Nashua Transit System - 2016-2025 Comprehensive Plan

The NTS Comprehensive Plan evaluated the condition and effectiveness of existing transit services and facilities and prioritized future service expansions and the corresponding capital requirements over the 2016–2025 time frame. The planning process included a robust public outreach effort to collect input related to public transit in the Nashua Region, including residents' interest and potential level of demand for public transit service, as well as general preferences related to travel in the region.

Demographic trends and environmental factors that influence transit use within the region were also studied, from the perspective of both present-day data and future projections.

The NTS mission statement was identified during the development of the plan and is as follows:

To provide a level of public transportation that allows for a convenient, affordable, reliable and environmentally friendly method of transportation servicing the needs of citizens through a dedicated, professional, and customer focused workforce.

Finally, the plan identified broad areas of priority action and specific implementation items organized by short, medium, and long-term timelines for the ten-year planning horizon. The priorities are as follows:

Affordability – Maintain cost-effective and affordable fares.

Passenger Amenities – Operate clean and well-maintained buses and facilities, while developing additional amenities such as bus shelters, lighting and public art. Passenger's comfort as well as current technological amenities should be taken into account when procuring new vehicles.

Safety and Security– Provide continuous mandatory and optional staff training to ensure passenger and facility safety and security through driver training,

Americans with Disabilities Act Compliance - As fleet replacements occur and additional vehicles are

purchased ensure that all are equipped with voice annunciation systems and interior LED signage for route and service information.

Intermodal Access - Assist commuters with improved access to both local and distant employment destinations through the development of an intermodal transportation network

Transit Center and Transit Hubs – Improve and expand the Transit Center. As transit expands consider the viability of locating transit hubs throughout the region.

Service Expansion

City of Nashua - Extend service hours on existing routes to improve convenience, and facilitate access to employment, education and retail sites. Evaluate the feasibility of extending earlier service on Saturday mornings. Also evaluate the feasibility of establishing Sunday fixed route and demand response service.

NRPC Region – Increase regional mobility by improving transit access in the region with connections to other communities such as the Towns of Hudson, Merrimack, Milford and Wilton as well as destinations like the Merrimack Premium Outlets and Walmart in Amherst or Hudson.

Beyond the NRPC Region - Improve regional mobility by providing transit connections to the Boston-Manchester Regional Airport, Manchester Transit Authority, and park and ride facilities to access destinations in Massachusetts via commuter rail or commuter bus service. Seasonal services to Hampton Beach and Canobie Lake Park should be considered and evaluated.

Nashua Transit System – Transit Asset Management Plan

The Nashua Transit System finalized its Transit Asset Management (TAM) Plan in July 2018. The Federal Transit Administration describes transit asset management as a business model that prioritizes funding based on the condition of transit assets in order to achieve or maintain transit networks in a state of good repair. It involves a set of strategic and systematic processes and practices for managing the performance, risks, and costs of transit assets over their entire lifecycle for the purpose of providing safe, cost-effective, and reliable public transportation. Through asset management, transit agencies can more effectively use available funds to improve the physical condition and performance of their system. This, in turn, may result in increased ridership. Benefits associated with transit asset management include:

- Better customer service due to improved on-time performance, vehicle and facility cleanliness, and a focus on customer-centered goals and metrics;
- Improved productivity, reduced safety risks and reduced costs from more effectively using condition-based approaches and using predictive and preventive maintenance strategies to reduce costs while improving service delivery; and
- Data-driven decision making that:
 - incorporates lifecycle cost, risk, and performance trade-offs into operations and capital programming;
 - improves visibility for budgeting maintenance work and for understanding other costs or financial risks due to major component and/or other replacement needs; and,

- provides better understanding of the relationship between investments and outcomes (condition, safety, operations) and can lead to more accurate estimates of system needs to meet a target condition.

Future Public Transportation Ridership

The future of public transportation ridership in the short to medium term is likely to depend on population growth; the public funding commitment to supplying transit; and factors that make driving more or less attractive, such as the price of parking, the extent of highway congestion, and the implementation of fuel taxes, tolls, and mileage-based user fees. Over the long term, ridership is also likely to depend on the introduction of autonomous vehicle technology, although its timing is uncertain. Fleets of driverless taxis that can be hailed with a smartphone, a plausible scenario, promise to be much cheaper than taxis and ride sourcing today. Widespread deployment of driverless taxis could reduce transit ridership, unless restrictions or fees make them an expensive alternative in some areasⁱⁱ.

COMMUNITY TRANSPORTATION

Regional Coordinating Council

The Nashua Regional Coordinating Council (RCC) Region 7 works to provide improved, cost effective, coordinated transportation services to those who need it, including persons with disabilities, the elderly, and individuals with lower incomes.

The New Hampshire State Legislature created the State Coordinating Council for Community Transportation (SCC) in 2007 to foster and guide the coordination of community transportation on the regional level. The Nashua Regional Planning Commission (NRPC) initiated development of the Nashua RCC based on recommendations from the 2006 Locally Coordinated Transportation Plan. In January 2007, a committee of stakeholders from across the region was formed to guide the RCC development process. Bylaws, a Memorandum of Understanding (MOU), a work plan, and a member list were developed, and in 2008 the SCC officially recognized the committee as the Nashua RCC, the first group to be recognized in the state

Now, New Hampshire is divided into nine Community Transportation Regions. Each region has an associated Regional Coordinating Council (RCC), which is composed of local transportation providers, human service agencies, funding agencies and organizations, consumers, and regional planning commission staff.

The RCCs work to develop information that is helpful to transportation service users, to identify opportunities for coordination between service providers, to advocate for improved service availability and innovative strategies to meet current needs, to identify alternative funding sources, and to advise the SCC as to the state of coordination in the region.

The Nashua RCC supports community transportation in a variety of ways:

- NRPC continues to serve as the lead agency for Nashua RCC in securing federal funding through the NH Department of Transportation.
- The Nashua RCC continues to support the Souhegan Valley Transportation Collaborative (SVTC) in their request for 5310 Purchase of Services and Formula funds. SVTC uses these funds to purchase demand response paratransit service from the Nashua Transit System (NTS) and

provide mobility management and planning assistance to its passengers and member communities

- The Nashua RCC Transportation Directory is a list of transportation services in the region.
- The Locally Coordinated Transportation Plan will be updated in 2020. Federal transit law requires that projects selected for funding under the Enhanced Mobility for Individuals and Individuals with Disabilities (Section 5310) Program be "included in a locally developed, coordinated public transit-human services transportation plan, and that the plan be "developed and approved through a process that included participation by seniors, individuals with disabilities, representatives of public, private, and nonprofit transportation and human services providers and other members of the public utilizing transportation services. These coordinated plans identify the transportation needs of individuals with disabilities, older adults, and people with low incomes, provide strategies for meeting these needs, and prioritize transportation services for funding and implementation.
- The Nashua RCC continues to monitor statewide activities through regular attendance at SCC meetings.

Souhegan Valley Transportation Collaborative

The Souhegan Valley Transportation Collaborative (SVTC) operates Souhegan Valley Rides, a dial-a-ride demand response bus service in the western part of the region. Souhegan Valley Rides serves the towns of Amherst, Brookline, Hollis, Milford, Mont Vernon and Wilton. The service operates Monday through Friday between the hours of 8 a.m. and 6 p.m. As of June 30th, 2018, the service had provided 28,441 rides.

The buses, drivers, and call center operations for Souhegan Valley Rides are subcontracted from the Nashua Transit System. Milford residents comprise the largest share accounting for 73 percent of all rides. The service is sustained through fares, municipal appropriations and federal funding. The service is popular; in Milford, the only town in which residents vote directly on funding of the service, 78 percent of voters approved spending for Souhegan Valley Rides in 2013 (Town of Milford).

Mobility Management Services

The Nashua RCC will continue to support and enhance regional and inter-regional Mobility Management services. Mobility management is an innovative approach for managing and delivering coordinated transportation services to customers, including older adults, people with disabilities, and individuals with lower incomes. Mobility management focuses on meeting individual customer needs through a wide range of transportation options and service providers. It also focuses on coordinating these services and providers to achieve a more efficient transportation service delivery system.

Mobility managers serve as policy coordinators, operations service brokers, and customer travel navigators. As policy coordinators, mobility managers help communities develop coordination plans, programs, and policies, and build local partnerships. They also work to promote land-use policies that favor transit-oriented development, public transportation, and pedestrian access. As brokers, they coordinate transportation services among all customer groups, service providers, and funding agencies. And, as travel navigators, they work with human service agencies and/or workforce centers that coordinate the travel and trip planning needs of individuals who receive human service program assistance.

INTERCITY TRANSIT

Manchester Transit Authority

The Manchester Transit Authority operates its Nashua Express service on weekdays and Saturdays between downtown Manchester and the Nashua Mall (FEE Turnpike Exit 6). There are 5 round trips on weekdays and 4 on Saturdays. This service provides a connection to the Nashua Transit System via Routes 8 and 9 which run to the NTS Transit Center where passengers have full access to the Nashua Transit System route network.

Lowell Regional Transit Authority

The Lowell Regional Transit Authority provides fixed route transit service to Ayotte's Market in Hudson, NH, located just over the state line from Tyngsborough. The market serves as the turnaround point for LRTA's Route 10 Dracut/Tyngsborough service. LRTA offers 13 round trips on Route 10 on weekdays and 10 on Saturdays linking Ayotte's with the Robert B. Kennedy Bus Transfer Station located at the Gallagher Intermodal Center, providing MBTA commuter rail service to Boston. The Kennedy Transfer Center serves as the transfer point for all LRTA local bus routes and several intercity bus routes operated by other providers. LRTA also offers a seasonal Pheasant Lane Mall route during the holiday shopping season on Saturdays only. The route links the Kennedy Transfer Center with the large shopping center in Tyngsborough, (formerly known as TJ Maxx Plaza) which includes a large movie theater, restaurants and several retail stores, as well as the Pheasant Lane Mall. The bus does not actually cross the state line as much of the mall parking lot is located in Tyngsborough

Boston Express

Boston Express is a public-private bus service linking Nashua to Boston. The service is operated by a private company. Departures leave from the Exit 8 park-and-ride facility in Nashua and service South Station and Logan International Airport, two of New England's largest transportation terminals, in Boston. The bus also stops at the Exit 35 park-and-ride facility in Tyngsborough, Mass. Lot counts indicate that vehicles with NH license plates make up approximately 70 percent of users of those facilities. Boston Express offers 13 daily departures from Boston and 12 arrivals on weekdays between 5 a.m. and 10:30 p.m.

Concord Coach Lines

Concord Coach Lines is an inter-city bus company based in Concord, New Hampshire that provides two roundtrips trips from Nashua to New York City on Fridays and Sundays.

Greyhound

From Keene and Nashua (eastbound) on Friday afternoon and Nashua to Keene (westbound) on Sunday afternoon. Connection to Boston.

FUTURE NEEDS ANALYSIS

POPULATION AND EMPLOYMENT FORECASTS

The analysis of future transportation needs depends heavily on the traffic forecasts produced by the TransCAD traffic model. The future analysis year of 2045 was agreed upon mutually by the four MPO's in New Hampshire, which provides a 30-year planning horizon from the 2015 base year. Developing these traffic forecasts was based on a lengthy process of developing estimates of future population and employment forecasts, first by community and then allocated to individual traffic analysis zones.

Through a combination of in-person interviews and other correspondence with local officials in most communities, NRPC compiled a list of known and potential areas of residential development through 2045. These new households were then added to the appropriate TAZ and current Census/ACS ratios were used to split the totals for various subcategories, such as:

- Household size
- Vehicles available
- Labor force
- Occupation

This data was measured against the results of NRPC's in-house population projections, which rely on a similar methodology to one once used by what is now the New Hampshire State Office of Strategic Initiatives. In cases where potential developments did not generate enough population to reach the projected totals, further households were added to TAZs where vacant and properly-zoned land was available, if possible. In cases where they generated more population than projected, NRPC did not include developments that were assumed as potential rather than known to be built. If known developments alone still surpassed projections, NRPC allowed them to be entered as model inputs.

For the rural towns with little assumed future growth, NRPC relied strictly on the population projects and manually adding new households to appropriate TAZs with buildable area.

New Hampshire Employment Security publishes industry-specific employment projections at the planning region level for 10 years out, with the latest available dataset projecting to 2024. To reach NRPC's horizon year of 2045, these projections were extended out using straight-line methodology and assumed to be proportionally distributed across all 13 communities. Methodology for assigning new employees to the TAZ level are similar to the above population projections, with known and assumed developments taking precedence and manual adjustments made up or down where possible to replicate the total projections.

Significant changes to age distribution are forecasted thirty years into the future. While the under 20 and 20 to 44 age groups regionally will show little change as a percent of total population (although significant shifts within individual communities are forecasted), the 45 to 64 group is expected to decline by 18% and the 65 and over group will more than double, with over 28,000 seniors added to the regional population. This changing demographic will have implications for the need for single-occupancy vehicle alternatives, including regular transit, special-purpose demand-responsive services ride-hailing services and autonomous vehicles, as they become mainstreamed into the transportation network in future years.

**2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects**

Population and Employment Projections to 2045

	<u>Population</u>						<u>Employment</u>			
	2015	2025	2035	2045	2015- 2045	Pct. Incr	2015	2045	Emp Growth	Pct. Incr
Amherst	11,247	11,660	11,661	11,536	289	3%	4,507	4,941	434	10%
Brookline	5,100	5,424	5,726	5,862	762	15%	487	707	220	45%
Hollis	7,733	7,804	8,089	8,585	852	11%	2,067	2,282	215	10%
Hudson	24,682	25,626	26,537	27,119	2,437	10%	10,191	18,873	8,682	85%
Litchfield	8,366	8,591	8,783	8,977	611	7%	915	1,316	401	44%
Lyndeborough	1,707	2,034	2,095	2,101	394	23%	98	119	21	21%
Mason	1,390	1,478	1,498	1,421	31	2%	181	200	19	10%
Merrimack	25,595	27,357	28,187	28,299	2,704	11%	17,202	19,243	2,041	12%
Milford	15,194	16,307	17,115	17,557	2,363	16%	6,097	7,234	1,137	19%
Mt. Vernon	2,620	2,710	2,746	2,705	85	3%	138	181	43	31%
Nashua	87,110	90,329	91,859	91,080	3,970	5%	51,192	56,093	4,901	10%
Pelham	13,113	13,929	14,422	14,808	1,695	13%	2,363	2,505	142	6%
Wilton	3,681	3,835	3,852	3,947	<u>266</u>	<u>7%</u>	<u>1,208</u>	<u>1,336</u>	<u>128</u>	<u>11%</u>
Region	207,538	217,084	222,570	223,997	16,459	8%	96,646	115,030	18,384	19%
10-yr incr.		4.6%	2.5%	0.6%						

Population Change by Age Group: 2015 - 2045

	<u><20</u>	<u>Pct</u>	<u>20-44</u>	<u>Pct</u>	<u>45-64</u>	<u>Pct</u>	<u>65+</u>	<u>Pct</u>
Amherst	(531)	-16%	1,119	45%	(1,596)	-41%	1,297	79%
Brookline	(237)	-15%	449	34%	(503)	-28%	1,053	252%
Hollis	146	8%	1,085	72%	(857)	-27%	478	43%
Hudson	(336)	-5%	377	5%	(1,076)	-16%	3,472	101%
Litchfield	(169)	-7%	571	25%	(743)	-27%	952	97%
Lyndeborough	87	26%	123	29%	(40)	-6%	223	79%
Mason	(111)	-31%	42	14%	(181)	-32%	280	161%
Merrimack	181	3%	74	1%	(2,417)	-28%	4,866	154%
Milford	190	5%	387	8%	(416)	-9%	2,202	108%
Mont Vernon	(187)	-24%	130	23%	(302)	-31%	443	141%
Nashua	63	0%	(4,291)	-14%	(2,148)	-9%	10,346	90%
Pelham	(132)	-4%	444	12%	(893)	-21%	2,276	140%
Wilton	56	7%	135	14%	(472)	-36%	547	98%
NRPC Region	(980)	-2%	645	1%	(11,642)	-18%	28,436	104%

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Employment by Category: 2015 & 2045

	Arts/		Educ/		Info		Other		Prof	Pub	Ret	Whole		
<u>2015</u>	Agr	Rec	Const	Hlth	Finc	Svc	Manuf	Svc	Svc	Admin	Trade	Trade	Transp	Total
Amherst	0	397	167	898	114	4	866	128	404	147	1024	123	235	4507
Brookline	0	36	165	18	8	10	10	22	51	59	86	12	10	487
Hollis	48	107	95	503	66	3	516	53	323	102	136	63	52	2067
Hudson	0	784	592	1163	171	222	3308	292	979	254	1618	585	223	10191
Litchfield	10	155	117	286	3	8	75	42	86	70	40	18	5	915
Lyndbor	0	0	15	0	0	0	0	17	7	26	11	14	8	98
Mason	2	64	18	21	0	0	1	5	37	18	15	0	0	181
Merrimack	3	976	526	1427	4978	73	2534	674	2750	262	2415	310	274	17202
Milford	7	796	182	979	127	7	1769	195	379	245	1124	195	92	6097
Mt Vernon	0	1	1	49	1	8	13	3	17	25	9	9	2	138
Nashua	0	5233	1205	11511	1403	1415	6678	1569	6616	1802	10025	2277	1458	51192
Pelham	0	190	145	464	83	89	444	71	181	139	353	140	64	2363
Wilton	2	75	55	245	6	74	426	18	169	51	40	10	37	1208
Total	72	8814	3283	17564	6960	1913	16640	3089	11999	3200	16896	3756	2460	96646
<u>2045</u>														
Amherst	0	408	144	1303	119	20	650	167	582	132	1037	198	181	4941
Brookline	5	41	207	169	8	16	19	20	18	83	82	23	16	707
Hollis	35	128	236	638	74	6	503	51	252	109	151	45	54	2282
Hudson	19	817	645	1504	215	275	8993	282	598	215	1968	3069	273	18873
Litchfield	0	520	131	387	3	8	69	16	55	66	39	22	0	1316
Lyndbor	0	4	43	0	0	0	0	15	6	19	12	11	9	119
Mason	0	96	28	33	0	0	0	2	2	20	15	0	4	200
Merrimack	5	1269	587	2016	5135	232	2688	438	3040	296	3000	255	282	19243
Milford	2	971	148	1326	167	81	1878	209	813	224	1106	225	84	7234
Mt Vernon	0	1	7	88	0	6	10	0	7	26	12	20	4	181
Nashua	0	5798	1355	14161	1771	1577	6574	1889	7039	1811	10017	2524	1577	56093
Pelham	0	208	167	645	90	55	461	60	123	129	388	144	35	2505
Wilton	4	68	49	297	17	25	603	17	111	45	44	11	45	1336
Total	70	10329	3747	22567	7599	2301	22448	3166	12646	3175	17871	6547	2564	115030
2015-2045	-2	1515	464	5003	639	388	5808	77	647	-25	975	2791	104	18384
Pct Change	-3%	17%	14%	28%	9%	20%	35%	2%	5%	-1%	6%	74%	4%	19%

TRAFFIC MODEL FORECASTS

Travel Model Methodology

The Nashua Regional Planning Commission maintains a regional travel demand model for the general purposes of transportation planning and air quality analysis. To maintain and run the model, NRPC uses TransCAD, a leading traffic modeling and GIS software package produced by the Caliper Corporation. The main inputs of employment and household data are summarized by Traffic Analysis Zone (TAZ). There are 2,034 TAZs in the NRPC model, including roughly 50 external zones. Each TAZ contains totals of households, residents and employees. Residents and employees are both assigned an industry classification, based on Census data. Industry classes include retail, manufacturing, professional services, finance and real estate, and others. In addition, each household is coded with the number of vehicles available to it, also derived from Census data. The NRPC travel demand model is the most complex model maintained by MPO staff in the state. The base year of the model was calibrated to traffic counts through 2013 and uses 2010 U.S. Census data and employment data from the State of New Hampshire.

NRPC's model network consists of nearly every thru-traffic road in the region (over 800 total miles of segments) and certain major routes outside of the region to account for external trips. Each road segment is coded with certain attributes needed to run the model which include direction, length, posted speed and roadway capacity.

The Model uses a traditional 3-step modeling process: trip generation, trip distribution, and traffic assignment. A 4th step, mode choice, is not used by the NRPC model as means of travel other than the automobile represent an extremely small fraction of the total traffic on the regional road network.

In step one, trip generation, the model uses ITE trip generation rates and origin destination surveys to determine how many trips of various purposes will be produced by each TAZ, based on the associated socioeconomic data.

In step two, trip distribution, the model takes the expected number of trips produced and attracted by each zone and matches them with destinations. NRPC uses a "gravity model" to distribute the trips, meaning that a trip is more likely to travel to in a nearby zone that matches the trip purpose. The model uses average journey to work time to determine the appropriate percentage of trips distributed between the zones. For example, if survey and census data show that 60% of all work trips take between 20 and 30 minutes, the model will attempt to match that ratio.

Once the model knows where all the trips begin and end, it can find the paths on which to assign them. The model begins by sending every trip via the shortest path possible (in terms of time). Then, because of capacity constraints, it uses an iterative process to reassign certain trips along alternate routes.

The three step process results in future traffic forecasts are based on anticipated future land use patterns, population projections, projected housing units, employment, and school enrollment. The projected growth in land use was made in consultation with local planners from the Nashua Region, and through a review of present and proposed zoning, physical constraints, and assumptions made regarding future area-wide growth rates.

Model networks were developed for the No Build condition and Build scenarios 2045. The Build condition networks include projects currently under implementation through the Ten-Year Plan or are

included as fiscally constrained MTP projects. The latter group are in the planning and project development phases and may not have environmental permits or secured funding at this time

2045 No-Build Traffic Forecasts

The 2045 No-Build forecast is based on future trips forecasted assigned to the existing highway network. Future capacity enhancing projects may be included in the No-Build if a construction phase is included in the first year of the TIP. The NRPC TIP does not have any capacity projects that meet these criteria, so the base year network is utilized in the No-Build highway assignment.

The following table provides the estimate of vehicle trip growth for the future. As the population age cohort shifts significantly in future years, work trips will grow at a much lower rate than the other trip types. Total trips are estimated to increase by 10.5% in the region by 2045. There are two reasons why trip growth is expected to exceed population growth. First, because employment growth is forecasted to substantially exceed population growth, more people will be commuting within the region rather than to external locations. While this alone does not change the number of regional trips for work, it does mean that many trips made by these workers during the business day will be made outside of the NRPC region and will not count toward HBO or NHB trips in our region. Second, it is likely that the higher proportion of retired persons in the region will make more trips during the day than they did while working a full day.

Vehicle Trips for Highway Assignment by Purpose, 2015 & 2045

	<u>2015</u>	<u>2045</u>	Trip <u>Growth</u>	Pct. <u>Change</u>
Home-based work	360,971	375,322	14,351	4.0%
Home-based other	453,907	508,202	54,295	12.0%
Non home-based	<u>426,847</u>	<u>488,006</u>	<u>61,159</u>	<u>14.3%</u>
	1,241,725	1,371,531	129,806	10.5%

The next table provides the regional summary of 2045 No-Build vehicle miles and hours traveled. Compared with the 10.5% trip increase, VMT is projected to increase only 6%, due to shorter trip lengths. This is a result of work trips (generally of greatest length) increasing less than other trip types such as shopping, social/recreational and personal business (generally of a shorter nature). However, VHT increases at nearly twice the rate as VMT and somewhat more than the trip totals. This shows that significant worsening of congestion would occur in the future without important projects such as the NH 101A and F.E.E. Turnpike widening, which have been programmed in the TYP.

Highway Assignment Summary, 2015 & 2045 No-Build

	2015 No-Build	2045 No-Build	% Change 2015-45 NB
Vehicle Trips	1,241,725	1,371,531	10.5%
Veh. Miles Traveled	11,011,325	11,678,157	6.1%
Veh. Hours Traveled	405,630	452,067	11.4%
Ave Trip Length (Mi.)	8.87	8.51	-4.0%
Ave Trip Time (Min.)	19.60	19.78	0.9%

Forecasted traffic volumes by location for the 2045 No-Build scenario are presented in the following table. A countertrend that is immediately noted is the double-digit growth on the Taylor Falls Bridge, which has shown little change over the past two decades. The higher than average river crossings can be attributed to the high concentration of new employment located in Hudson without commensurate increases in population in each community. Most of the new employment, then, will come from out-of-town residences, many being across the river from workplaces. A volume-to-capacity ratio of 1.13 at the T.F. Bridge translates to congested travel speeds of about 7 miles per hour.

Turnpike traffic increases (without widening) would be greatest in the segment between Exits 2 and 6 in Nashua with rates of growth being progressively lower to the north. The segment between Exits 8 and 10 would operate at over-capacity for the two-lane section as they do at present. It is likely that diversion of some traffic occurs under this congested condition, evidenced by the low growth rate in conjunction with the high V/C, supporting the imperative need to widen the two-lane segment.

Along NH 101A the highest growth forecasted for an unimproved roadway is in the vicinity of the Nashua/Merrimack line at 15% growth in traffic. In Milford the highway is forecasted for around 10% growth. Within the town, the highway will operate at near full capacity conditions and is not included in the widening program.

Route 130 west of the turnpike is projected for 14% traffic growth and a V/C ratio at 1.07. NH 111 over the turnpike is also projected at 14% growth. Segments of US 3 Daniel Webster Highway in Merrimack are projected to increase in the 11 to 15% range under the No-Build. Some of these increases will be mitigated by the widening of the turnpike, as detailed in the analysis of projects.

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2045 No-Build Traffic Forecast

Highway	Location	Existing AWDT	2045 NB Volume	Pct. Change	Vol/ Cap
Taylor Falls Bridge	Nashua/Hudson T/L	36,820	40,770	10.7%	1.13
Sagamore Bridge	Nashua/Hudson T/L	49,740	56,020	12.6%	0.72
FEE Turnpike	Mass. S/L	91,560	93,330	1.9%	0.80
FEE Turnpike	B/t Interchange 2 & 3	108,800	117,290	7.8%	0.67
FEE Turnpike	B/t Interchange 4 & 5	113,000	120,430	6.6%	0.69
FEE Turnpike	B/t Interchange 5 & 6	141,300	152,100	7.6%	0.78
FEE Turnpike	B/t Interchange 7 & 8	97,000	101,830	5.0%	0.58
FEE Turnpike	b/t Interchange 8-10	81,200	83,740	3.1%	1.07
FEE Turnpike	B/t Interchange 10 & 11	72,500	75,770	4.5%	0.65
FEE Turnpike	B/t Interchange 11 & 12	73,600	75,130	2.1%	0.96
FEE Turnpike	B/t Interchange 12 & 13	64,000	64,350	0.5%	0.82
FEE Turnpike	Bedford Tolls	49,700	49,750	0.1%	0.64
NH101 - Wilton	W. of Wilton Center Rd	10,600	10,550	-0.4%	0.50
NH101 - Milford	E. of Wilton Rd	23,690	24,330	2.7%	0.93
NH101 - Milford	W. of NH13	19,990	21,230	6.2%	0.71
NH101 - Milford	E. of NH13	27,900	28,800	3.2%	0.96
NH101 - Amherst	N. of Baboosic Lake Rd	22,010	22,340	1.5%	0.74
NH101 - Amherst	Bedford T/L	21,130	20,810	-1.5%	0.69
NH101A - Milford	W. of Old Wilton Rd	7,620	7,770	2.0%	0.47
NH101A - Milford	E. of Cottage St	14,450	16,320	13.0%	0.98
NH101A - Milford	E. of Oval	12,650	13,200	4.3%	0.82
NH101A - Amherst	E. of NH122	30,670	32,110	4.7%	0.80
NH101A - Merrimack	Hollis T/L	36,480	39,510	8.3%	0.99
NH101A - Merrimack	Nashua T/L	41,680	48,080	15.3%	0.77
NH101A - Nashua	E. of Thornton Rd	42,310	45,370	7.2%	0.91
NH101A - Nashua	E. of Henri Burque	24,370	25,370	4.1%	0.45
NH101A - Nashua	W. of Main St	20,050	20,580	2.6%	0.72
NH130 - Brookline	Milford St east of NH13	2,450	3,340	36.4%	0.20
NH130 - Hollis	at Hollis T/L	6,510	6,980	7.2%	0.42
NH130 - Nashua	at Nashua C/L	8,790	9,310	5.9%	0.62
NH130 - Nashua	west of FEET	37,170	41,610	11.9%	1.05
NH130 - Nashua	west of NH101A	12,440	13,420	7.9%	0.89
NH111 - Hollis	Mass S/L	8,220	8,820	7.3%	0.52
NH111 - Nashua	Hollis T/L	9,980	10,990	10.1%	0.65
NH111 - Nashua	over FEET	43,140	49,160	14.0%	0.91
NH111 - Nashua	Kinsley St W. of Ritter St	11,510	11,970	4.0%	0.72
NH111 - Nashua	Hollis St. W. of Main St	11,070	11,160	0.8%	0.80
NH111 - Nashua	Hollis St. E. of Main St	10,000	10,960	9.6%	0.88
Nh111 - Hudson	E. of Library St	14,560	15,130	3.9%	0.84
Nh111 - Hudson	Windham T/L	16,530	16,950	2.5%	0.85

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2045 No-Build Traffic Forecast, continued

Highway	Location	Existing AWDT	2045 NB Volume	Pct. Change	Vol/ Cap
Main Street - Nashua	S. of Amherst St	21,550	22,989	6.7%	1.02
Main Street - Nashua	over Nashua River	23,730	24,393	2.8%	0.81
Main Street - Nashua	N. of Hollis St	14,360	18,737	30.5%	0.62
Main Street - Nashua	S. of Hollis St	14,810	17,329	17.0%	0.58
NH3A - Hudson	Mass S/L	7,710	22,990	-5.4%	0.44
NH3A - Hudson	S. of Rena St	23,580	24,390	25.4%	0.90
NH3A - Hudson	S. of Wason Rd	39,950	18,740	7.5%	0.95
NH3A - Hudson	N. of Ledge Rd	26,330	17,330	3.6%	0.91
NH3A - Hudson	S. of Derry Lane	9,320	7,290	8.8%	0.61
NH3A - Litchfield	Manchester C/L	12,680	29,570	7.3%	0.80
NH38 - Pelham	Mass S/L	13,850	42,960	2.5%	0.79
NH38 - Pelham	Salem, NH T/L	13,610	27,280	2.1%	0.84
NH128 - Pelham	Mass S/L	10,400	10,140	9.5%	0.69
NH128 - Pelham	N. of Sherburne Rd	14,860	13,610	10.7%	0.99
NH128 - Pelham	Windham T/L	5,620	14,200	13.0%	0.38
DW Highway - Nashua	Mass S/L	18,880	13,900	2.2%	0.41
DW Highway - Nashua	S. of Sagamore Bridge	21,550	11,390	-1.6%	0.67
US3/Henri Burque	W. of Manchester St	14,210	16,450	4.4%	0.82
DW Highway - Nashua	Merrimack T/L	12,490	6,350	5.8%	0.80
DW/US3 - Merrimack	N. of Manchester St	14,510	19,300	10.3%	0.53
DW/US3 - Merrimack	N. of Industrial Dr.	11,840	21,210	9.2%	0.43
DW/US3 - Merrimack	S. of Bedford Rd	14,750	14,830	15.6%	1.14
NH13 - Brookline	Mass S/L	7,310	13,220	-12.4%	0.39
NH13 - Milford	S. of NH101 bypass	12,370	16,010	8.9%	0.79
NH13 - Milford	N. of NH101 bypass	5,480	12,930	11.1%	0.36
NH13 - Mont Vernon	Mont Vernon T/L	3,190	17,050	3.7%	0.19
NH31 - Mason	Mass S/L	2,570	6,400	9.3%	0.17
NH31 - Wilton	S. of NH101	3,540	13,470	-2.5%	0.20
NH31 - Wilton	downtown Wilton	2,780	6,090	9.3%	0.18
NH31 - Lyndeborough	Greenfield T/L	2,780	3,310	0.1%	0.16
NH122-Hollis	at Mass S/L	2,410	2,810	9.3%	0.15
NH122-Hollis	at Amherst t/l	4,290	3,450	27.4%	0.32
NH122-Amherst	s. of Baboosic Lake Rd	8,050	3,040	6.3%	0.50
NH 102-Hudson	N. of Ferry St	15,750	2,780	11.8%	0.88
NH 102-Hudson	Hudson/Londonderry T/L	14,750	2,630	1.0%	0.90
NH 102-Hudson	Litchfield/Hudson T/L	16,900	5,470	9.5%	1.12

PUBLIC PERCEPTIONS AND PRIORITIES

The first task of the MTP update process was to undertake a regionwide online survey to identify travel characteristics, perceptions of traffic conditions along major highway corridors and more importantly, priorities among citizens and visitors to the region for transportation improvements. The public was also asked to identify which new revenue sources would be preferred for implementation of transportation projects.

The rankings shown in the following table appear to properly reflect congestion levels along highway locations; however, it should be noted that rankings are probably influenced by the frequency of use by area drivers. Daniel Webster Highway in South Nashua, for example, is likely used by the vast majority of NRPC residents, as it is a major regional shopping area. A location such as the Turnpike in the narrowed sections of Nashua and Merrimack experiences substantial delay during peak commuting periods, but this likely impacts a much smaller portion of regional travelers.

Congestion Ranked by Highway Location (5 = most congested)

	1	2	3	4	5	Ave. Rank
DW Highway - South Nashua	3%	9%	23%	32%	33%	3.83
Spitbrook Road/Exit One (Nashua)	5%	12%	23%	32%	28%	3.67
FE Everett Turnpike Exit 8 to Bedford Tolls	6%	14%	24%	29%	26%	3.54
Canal/Bridge Street (Nashua)	4%	13%	29%	31%	22%	3.54
Amherst Street - Exit 7 to Main St. (Nashua)	4%	13%	31%	34%	19%	3.51
NH 101A - Northwest Blvd to Exit 7 (Nashua)	5%	15%	30%	31%	19%	3.41
Taylor Falls Bridge (Nashua/Hudson)	10%	16%	27%	22%	25%	3.37
NH 101A Amherst/Hollis/Merrimack	7%	18%	33%	26%	16%	3.26
Main Street (Nashua)	6%	16%	38%	30%	11%	3.26
NH 3A Lowell Road (Hudson)	9%	19%	34%	21%	16%	3.15
Broad Street/NH 130 (Nashua)	7%	20%	38%	26%	9%	3.10
Ferry Street/NH 111 (Hudson)	9%	23%	38%	20%	10%	3.00
Sagamore Bridge (Nashua/Hudson)	12%	21%	38%	18%	12%	2.98
East Hollis/NH 111 (Nashua)	10%	24%	36%	21%	9%	2.94
DW Highway - Merrimack	11%	25%	35%	21%	9%	2.92
NH 102 (Hudson)	11%	26%	36%	19%	8%	2.87
NH 101 Milford	13%	29%	31%	20%	8%	2.83
West Hollis/NH 111 (Nashua)	11%	30%	36%	17%	6%	2.77
NH 122 at NH 101A (Amherst)	19%	31%	36%	11%	3%	2.48
NH 38 (Pelham)	23%	31%	7%	7%	4%	2.39
NH 128 (Pelham)	23%	31%	8%	8%	4%	2.39
NH 13 (Milford)	28%	35%	6%	6%	2%	2.19

Respondents were asked to rate various categories of transportation improvements. Maintenance of the existing system, including pavements, bridge reconstruction and signal controls ranked at the top, followed by passenger rail and expanded paratransit services for persons unable to use the fixed-route system. Ranked at the bottom were new roadway construction and bike lanes/paths (presumably because only a small portion of the public utilizes bicycles for travel along arterials).

Importance of Transportation Projects (1 = most important)

	1	2	3	4	5	Ave. Rank
Maintaining existing streets & highways	43%	15%	14%	11%	16%	2.42
Repairing or replacing "Red List" bridges	37%	21%	13%	12%	18%	2.53
Improving traffic signal coordination	26%	19%	24%	18%	13%	2.72
Extend passenger rail to Nashua/Manchester	38%	16%	8%	10%	28%	2.74
Expand paratransit service for seniors/disabled	20%	23%	30%	15%	12%	2.78
Increasing capacity of highways	20%	23%	27%	17%	13%	2.79
Sidewalks & other pedestrian improvements	18%	25%	27%	17%	13%	2.82
Extend Nashua Transit to other communities	19%	23%	25%	16%	17%	2.88
Bike lanes & paths	21%	18%	24%	18%	19%	2.95
New roadway construction	13%	20%	34%	18%	15%	3.02

Recognizing that transportation projects involve substantial outlays of funds; the public was asked to identify additional revenue sources they would support. Only an increase in the state gasoline tax received greater than 50% support. Increasing the federal gas tax and turnpike tolls also received a degree of support among respondents. Introduction of "mileage taxes" or increasing property taxes to fund transportation improvements were particularly unpopular funding alternatives.

Support for Additional Transportation Revenue Sources

	Support	Neutral	Oppose
Increase the federal gasoline tax	44%	20%	36%
Increase the state gasoline tax	52%	15%	33%
Increase NH Turnpike toll rates	42%	26%	33%
New tolls on federal highways such as I-93	34%	20%	46%
Introducing a new federal "mileage tax"	17%	18%	64%
Introducing a new state "mileage tax"	18%	17%	65%
Increasing automobile vehicle registration fees	30%	23%	47%
Registration surcharge for electric/hybrid vehicles	34%	18%	48%
Increase property taxes for transportation projects	12%	13%	75%

As the MPO works to identify future transportation priorities, survey respondents were asked to rate the importance of major projects from the 2015-2040 MTP. The top ranking went to the passenger rail extension, followed by turnpike widening and construction of a southbound off-ramp at Exit 36 to South Nashua. Major improvements on NH 101, including widening to two-lanes per direction and construction of a new interchange to Perry Rd. in Milford, were ranked least important.

***Importance of 2015-2040 NRPC Transportation Plan Major Investment Projects
(1 = most important)***

	1	2	3	4	5	Ave. Rank
Nashua/Manchester Commuter Rail extension to Boston	49%	15%	8%	6%	22%	2.35
FE Everett Turnpike widening - Exit 8 to Bedford Tolls	24%	24%	23%	15%	14%	2.69
Construct Rte. 3 Exit 36 southbound interchange	28%	21%	20%	14%	17%	2.69
Third Merrimack River Bridge Rte. 102 to DW Hwy.	18%	23%	27%	17%	16%	2.89
Expand Nashua Transit to Milford/Merrimack/Hudson	21%	20%	24%	15%	19%	2.90
101A Widening (select locations Milford to Nashua)	15%	26%	27%	17%	15%	2.90
Hudson Parkway - NH 3A to NH 111 in Hudson	15%	19%	32%	17%	18%	3.03
Remove FE Everett Turnpike ramp tolls at Exit 11	17%	21%	25%	16%	21%	3.05
NH 101 Widening to four lanes - Wilton to Bedford	13%	17%	23%	22%	24%	3.27
NH 101 interchange to Perry Road Underpass (Milford)	11%	15%	24%	22%	28%	3.41

TRANSPORTATION PROJECTS AND PROGRAMS

TEN YEAR PLAN PROJECTS

The first group of projects contained within the MTP are those included in the State of New Hampshire Ten Year Plan (TYP). The biennial update of the TYP results in the development and implementation of a plan allowing New Hampshire to fully participate in federally-supported transportation improvement projects as well as to outline projects and programs funded with State transportation dollars.

In advance of the TYP update cycle, the NRPC conducts a project solicitation process to add/delete/modify projects in its MTP. Following the update of the MTP project list, projects which are planned for submission to the TYP are evaluated based on performance criteria and ranked by the TTAC. Project costs are developed by local professional engineers or submitted to NHDOT for review by their engineering staff. The draft plan that is produced by the NHDOT with input from the regions (as noted, the NRPC as a TMA has sub-allocation authority, which ensures that local priorities will be programmed up to the sub-allocation total for the biennial period). The draft is put before the public through a series of public hearings held by the Governor's Advisory Commission on Intermodal Transportation (GACIT). The Plan then moves on to the Governor who provides recommendations which are then sent on to the N.H. Legislature. The Governor's version is then sent to the Legislature and the final version becomes law when signed by the Governor.

BRIDGE PROJECTS

The following bridge projects have been programmed in the TYP and address the deficiency ratings identified in the Existing Conditions section of this report.

<u>Municipality</u>	<u>Bridge Location</u>	<u>Project Type</u>
Amherst	Horace Greeley Rd. over Pulpit Brook	Replacement
Amherst	Mont Vernon Rd. over Caesars Brook	Replacement
Amherst	Thornton Ferry Rd. over Beaver Brook	Replacement
Amherst	NH122 over NH 101	Bridge Deck
Brookline	Bond St. over Nissitissit River	Rehabilitation
Lyndeborough	NH Railroad Bridge over Glass Factory Rd.	Rehabilitation
Merrimack	US 3 over Baboosic Brook	Replacement
Merrimack	Bedford Rd over Baboosic Brook	Replacement
Milford	Hartshorn Rd. over Hartshorn Brook	Replacement
Pelham	Main St. over Beaver Brook	Replacement
Pelham	Willow St. over Beaver Brook	Replacement
Pelham	Old Bridge St. over Beaver Brook	Rehabilitation
Wilton	Old County Farm Rd. over Blood Brook	Replacement
Wilton	Stage Coach Rd. over Burton Pond	Replacement

INTERSECTION IMPROVEMENTS

NH 13/Old Milford Rd. (Brookline)

The project will construct a southbound left turn lane on NH 13 at the intersection with Old Milford Rd. The five-year (2013-2017) crash history shows 6 accidents at this location, with 2 involving injuries. A 44% CRF is applied to this improvement for potential accident reduction. Although congestion reduction is not a priority, as the intersection operates at LOS B, there is minor queuing on Old Milford Rd. that would be lessened by improving gaps in the major approach volumes.



NH 3A/Sagamore Bridge Rd. (Hudson)

This CMAQ-funded project consists of constructing a third southbound right-turn lane on NH 3A from its intersection with Wason Rd/Flagstone Drive to the westbound ramp of the Sagamore Bridge.

Existing southbound traffic on NH 3A at this location is 20,000 per day, with a v/c ratio of 1.11, indicating over-capacity conditions. Without construction of an additional lane, a traffic level of 21,500 is forecasted for 2045, operating at v/c 1.20. With construction of the third lane, traffic will marginally increase to 22,000, but the additional lane capacity will reduce the v/c to 0.81.

NRPC performed an intersection impact analysis for the project at NH 3A/Wason Rd. for the CMAQ application. The most congested peak hour occurs in the morning period; the project is estimated to reduce vehicle delay at the intersection by 22% (2,130 minutes) for the one-hour period. The project would reduce ozone precursors: VOC are reduced by 2.23 kg per day and NOx by 0.77 kg per day.

Along the project impact area between the NH 3A/Wason Rd. and 3A/Sagamore Bridge Rd. intersections there have been 120 crashes over five years; 18 involved injuries, there was one fatality and 2 involved non-motorized travelers (pedestrians/bicyclists). The CRF for adding a right turn lane is a 14% reduction.

NH 3A Hudson Segment for Addition Southbound Left Turn Lane



US 3 Daniel Webster Hwy./Wire Rd. (Merrimack)

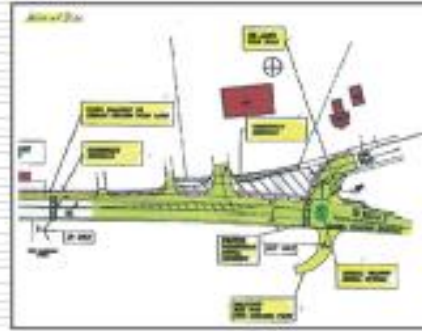
Wire Rd. intersects with US 3 at a 25-degree skew, impacting sight distance for traffic approaching from the north on DW Highway. The project seeks to accomplish multiple goals: 1) Realign the intersection to a regular T-intersection geometry with signalization or construct a roundabout; 2) coordinate signal operations with existing signals along US 3 at Front Street, Baboosic Lake Rd. and Connell's Plaza; and, 3) continue the sidewalk along US 3 from its current location from Baboosic Lake Rd/Merrimack Library to the Wire Rd. intersection.

The 5-year accident history indicates 8 incidents at the intersection, 4 involving injuries. Application of CRF indicates potential accident reduction of 25% from implementation of a roundabout and 30% from signalizing the intersection.

A traffic analysis conducted by a private consultant found that the Wire Rd. approach operates at LOS F during peak periods. Either a roundabout or signalization will relieve this bottlenecked approach while

increasing delay to some degree on the US 3 approaches. NRPC will update the traffic analysis to specifically identify the traffic impacts of the alternative improvements.

US 3/Wire Rd. Intersection Alternatives

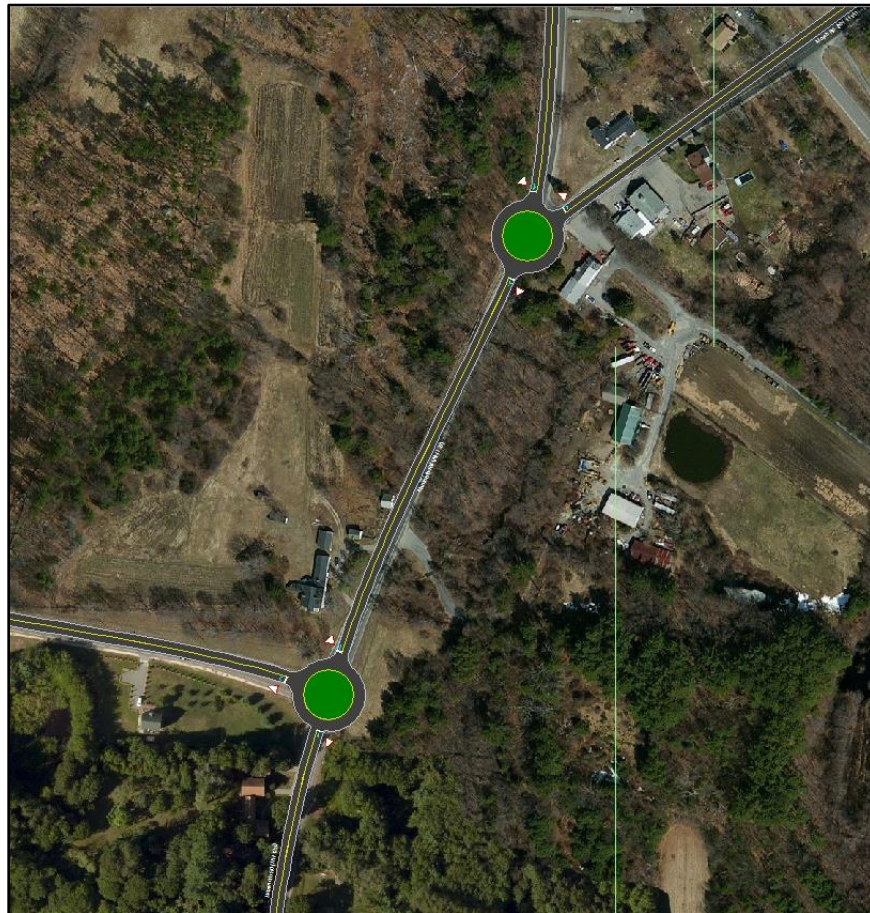


Route 128 Intersections (Pelham)

A CMAQ project approved in 2017 provides for construction of roundabouts at two intersections in close proximity to each other: NH 128/Sherburne Rd. and NH 128/NH 111A. The former operates at LOS F, with PM queuing on NH 111A Marsh Rd. necessitating a use of a police officer to direct traffic at Sherburne Rd. Lack of available gaps for entering traffic creates a significant safety hazard.

Accident history for 2013-2017 shows 39 crashes, of which 5 involved injuries. A 25% crash reduction is applied to roundabout construction at these intersections. The CMAQ project intersection analysis indicated a reduction of delay of over 80% (1,900 minutes) from roundabout construction (the existing condition delay does not assume police traffic control). The reduction in VOC is estimated at 5.1 kg per day and NOx at 1.8 kg.

NH 128 Roundabouts at NH 111A and Sherburne Road



East Hollis St and Bridge Street Intersection Reconfiguration (Nashua)

The Taylor Falls Bridge Area has historically been in the top tier of highly congested areas in the Nashua Area. Limited Merrimack River crossings in the region focus a great deal of east-west traffic to this area and the junction of Bridge Street and East Hollis Street on the Nashua side results in significant delay for drivers eastbound from Bridge Street to Ferry Street and westbound from Bridge Street to East Hollis Street. An improvement project was added to the TYP and a study conducted to select a preferred improvement alternative. The project addresses the following identified needs:

- Daily traffic congestion, queues and delay
- Lack of bicycle and pedestrian accommodations
- Merging vehicles creates safety concerns

- Limited access to Crown St. and new development
- The current configuration is not a welcoming gateway into Nashua

Identified goals of the project are to:

- Improve mobility of all users
- Improve access
- Facilitate land use
- Not adversely impact traffic
- Provide aesthetically pleasing gateway

Several alternatives were considered, with the apparent preferred alternative shown in the following figure. It utilizes two signals of three and four phases respectively to control traffic. Direct access to Riverside Landing is provided. Delay for traffic that now does not pass through the existing intersection (Hudson traffic to Bridge St. and East Hollis St. traffic to Hudson) will be increased but delay will be lessened for vehicles that use the existing intersection. The intersection level of service analysis summary for a 20-year period is shown in the following table:

East Hollis St./Bridge St. Intersection Improvement Level of Service Summary

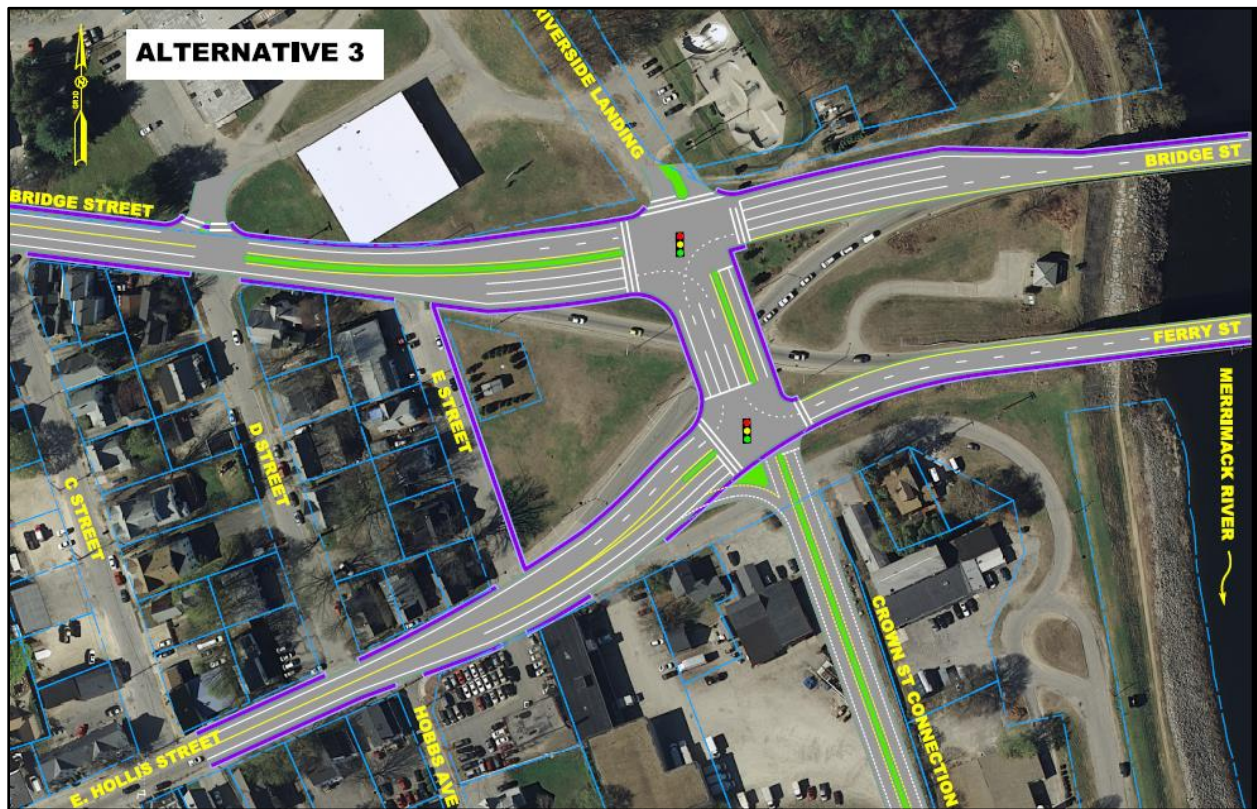
	No-Build		Alternative 3	
	<u>AM</u> <u>Peak</u>	<u>PM</u> <u>Peak</u>	<u>AM Peak</u>	<u>PM Peak</u>
E. Hollis St. to Hudson	A	B	D	F
Bridge St. to Hudson	D	F	C/C	D/F
Hudson to Bridge St.	A	A	B	B
Hudson to E. Hollis St.	C	D	D/A	D/A
Crown St. Access	--	--	D	F
Riverfront Landing	D	F	D	D
Reduces Neighborhood St Traffic	No change		Reduces traffic on D St.	

Nonmotorized access is enhanced by providing sidewalks and bike lanes to all areas of the intersection. A tradeoff for providing sufficient lanes to channel traffic through this busy area is that pedestrians will have to traverse five travel lanes for crossing over. Two large areas of greenspace are created.

There have been 58 accidents in the project area, 6 involving injuries; however, no pedestrian/bicycle accidents were recorded. It is not evident that a CRF should be applied to all vehicle activity, since the project entails replacing signals with a pair of signals; installation of bike lanes would warrant a 14% reduction factor for vehicle/bike crashes.

The project has positive benefits to Environmental Justice (EJ) zones, being located in a tract with poverty households constituting >20% of the total and minority populations 15%-20% of the total. Pedestrian access to groups with lesser access to private automobiles will be substantially enhanced.

East Hollis Street/Bridge Street Intersection Reconfiguration



CORRIDOR AND SUBAREA CIRCULATION IMPROVEMENTS

NH 111 East Hollis Street Intersection Improvements (Nashua)

East Hollis Street serves as a downtown arterial that services regional east-west traffic, linking the F.E.E. Turnpike and the Nashua core area with Hudson and points east. As a downtown collector, the roadway is utilized locally to access residential and commercial locations. Vehicular traffic is impeded by several factors including inconsistent cross-section, poor pavement conditions and inconsistent pavement markings/signage and inadequate shoulders and sidewalks in many locations. Pedestrian and bicyclist safety are a primary concern of the improvement program.

The project currently proposes eleven-foot travel lanes to provide adequate width without encouraging excessive operating speeds. Options for using either wide shoulders for bicycle use or narrow shoulders coupled with wider sidewalk/bikeways will be considered. Streetscape improvements include consistent lighting and landscaping.

The project evolved from the 2004 East Hollis Area Study which included an in-depth public outreach effort. A Steering Committee comprised of a cross-section of interests in the district evaluated analysis and alternatives at each stage of the process.

There have been 102 crashes along East Hollis St. over the past five years, 26 resulting in injuries and 5 involving pedestrians or bicyclists. Installation of bike lanes results in a CRF of 14% for bicycle/vehicle crashes. Other CRFs may apply once the project proceeds to conceptual design.

The project has positive EJ benefits, as the entire length of East Hollis Street is in census tracts for which minority and individuals in poverty are in the 15%-20% range or greater than 20% of total population. Pedestrian access to groups with lesser access to private automobiles will be substantially enhanced.

West Gateway Improvements (Nashua)

This project entails the reconfiguration of the West Gateway of downtown Nashua, including the Walnut Street Oval and one-way street pair of Factory and West Pearl Streets to improve traffic flow, reduce speeds and improve pedestrian access. The reconfiguration would transform the oval in to a city block configuration. Improving pedestrian access and safety is a major objective. The oval width and continuous fast speed operation create a physical and psychological barrier between the downtown and Mill yard areas.

Over a 5-year period there have been 79 accidents within the project area (total 1.07 miles). Of these, 10 have involved personal injury; 2 involved pedestrians/bicyclists. Depending on final design there may be several CRFs applied; an 18% generalized traffic calming countermeasure factor should provide a conservative estimate of expected safety improvement.

The project is not intended to address congestion issues. Although the intersection of Factory and Chestnut Streets has been identified as operating at LOS F, the oval area operates overall without delay; a project goal is to reduce speeds in order to achieve higher vehicular and pedestrian safety.

The project has positive mobility benefits to Environmental Justice (EJ) zones, being located in a tract with poverty households constituting >20% of the total and minority populations 15%-20% of the total. Pedestrian access to groups with lesser access to private automobiles will be substantially enhanced.

Nashua West Gateway Improvement Area



INTELLIGENT TRANSPORTATION SYSTEMS PROJECTS

F.E.E. Turnpike Open Road Tolling (Bedford-Merrimack)

The NHDOT will be implementing Open Road Tolling at the Bedford toll plaza, which will remove toll barriers and install new electronic systems which will enable toll collection with vehicles maintaining regular highway speeds. The system is now in place at the Hooksett and Hampton toll plazas.

The five-year crash history shows 31 crashes, with 14 involving injuries. In 2018 there was a fatality involving a distracted driver. Studies indicate CRFs ranging from 46% to 54% for all accident types and

66% for rear-end accidents. This project will have a substantial impact on improving the safety of toll collection on the turnpike.

Open Road Tolling Eliminates Hazardous Toll Barriers



F.E.E. Turnpike ITS Deployment (Nashua to Concord)

The NHDOT has programmed the implementation of intelligent transportation systems (ITS) on the Everett Turnpike. The project entails the design, planning and installation of dynamic message signs, closed-circuit video cameras, roadway detectors and wireless communications linking the ITS components to NHDOT's Transportation Management Center. These systems streamline incident response and management, improve safety in work zones, facilitate greater fuel efficiency for drivers and create "smart roads" that could potentially guide future autonomous vehicles. While there is not a CRF for installation of this technology, safety will be enhanced by increased awareness of work zones and increased emergency response time.

PEDESTRIAN AND BICYCLE PROJECTS

Several pedestrian and bicycle projects have advanced from local town plans to the State's TYP, as listed below. Although reliable CRFs have not been developed for sidewalks, undoubtedly safety is enhanced where they remove pedestrian activity away from vehicle travel lanes; the 14% CRF for bike lanes is applied to those projects.

Route 130 (Brookline)

Sidewalk construction along Rte. 130, South Main St. and Mason Rd with pedestrian bridge over the Nissitissit River and sidewalk to the beach.

Multi-Use Path (Merrimack)

Construct a 2,500-foot multi-use trail connecting parks, schools and the downtown business district with an existing trail and sidewalk network.

Swing Pedestrian Bridge (Milford)

The project is comprised of removal/repaving of 60 feet of each approach to the 200-foot pedestrian bridge on Bridge St. over the Souhegan River.

Daniel Webster Hwy Pedestrian Improvements (Nashua)

The project's focus is to provide pedestrian safety improvements, including the addition of crosswalks with pedestrian crossing signals, median respite areas and tip downs for ADA accessibility. The roadway is a highly congested mixed-use corridor; the residential component has been trending higher, resulting in higher numbers of pedestrian trips to commercial activity centers. There have been 4 accidents involving pedestrians over the past five years along D.W. Highway.

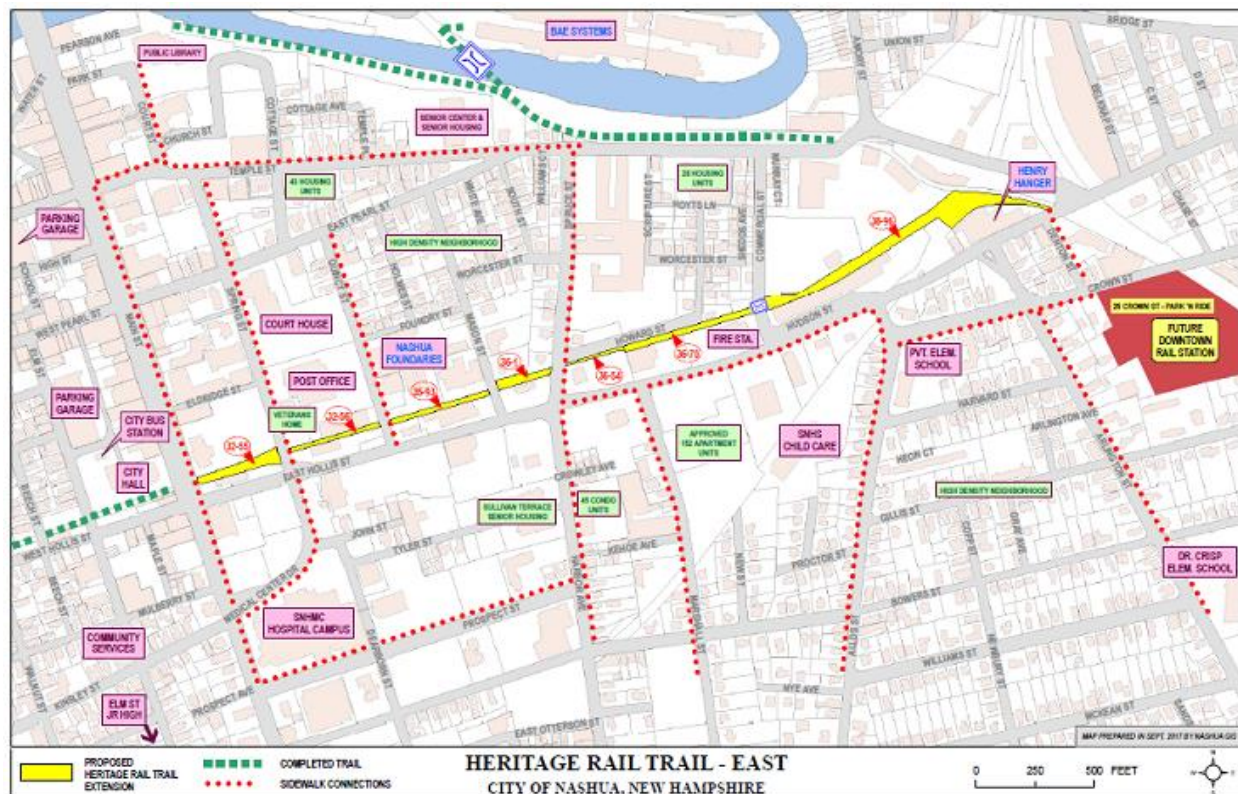
The project has positive mobility benefits to Environmental Justice (EJ) zones, being located in a tract with poverty households constituting >20% of the total and minority populations 15%-20% of the total. Pedestrian access to groups with lesser access to private automobiles will be substantially enhanced.

Heritage Rail Trail East (Nashua)

The Heritage Rail Trail East Project will extend the bike and pedestrian from the Heritage Rail Trail West's terminus at Main Street in downtown Nashua and continue the trail to the East Hollis Street/Denton Street intersection.

The project has positive mobility benefits to Environmental Justice (EJ) zones, being located in a tract with poverty households constituting >20% of the total and minority populations 15%-20% of the total. Pedestrian access to groups with lesser access to private automobiles will be substantially enhanced.

Heritage Rail Trail East



CAPACITY IMPROVEMENTS

Hudson Boulevard

The Hudson Boulevard is a project that utilizes the southern alignment of the original Circumferential Highway concept, providing a two-lane controlled access highway with at-grade intersections between NH 3A and NH 111 in Hudson. In the previous MTP the Hudson Blvd. (also known as the Hudson Parkway) was identified as an Illustrative project, as state and federal funds are not likely to be sufficient to implement the project within the MTP time frame. In 2018, the NHDOT added the project to the TYP as a local-funded, state-managed project. Its inclusion as an MTP fiscally-constrained project rests on the premise that the Town of Hudson will approve a bond issue at its 2019 Town Meeting which will provide a financing plan. It is anticipated that grants and alternative funding sources will be sought and utilized for the project. Should the Town fail to pass the bond measure, the projects fiscally-constrained status would be revoked and the project either revert to Illustrative status or removed from the MTP (at the Town's discretion). Having been long-identified as the alignment for a future roadway, the right-of-way has been generally protected from development over the years.



The project's primary purpose is to relieve traffic congestion in the center of Hudson along NH 111 and 3A, as well as reversing the trend of diversion of through traffic to local roads, including Wason Rd. and Bush Hill Rd. Increased safety is also a project objective, by removing traffic from a number of congested intersections and driveway curb cuts to a corridor with controlled access.

Hudson Boulevard Traffic Impact

		2015 Ct	2015 V/C	2045 NB	NB V/C	2045 Bld	NB to Bld %	Bld V/C
Hudson Blvd	East of NH 3A	--	--	--	--	24,930	--	0.83
Hudson Blvd	N. of Bush Hill Rd	--	--	--	--	20,730	--	0.83
Taylor Falls Br	Hud/Nashua CL	36,820	1.02	40,770	1.13	36,260	-11%	1.01
Sagamore Br	Hud/Nashua CL	49,740	0.64	56,020	0.72	63,760	14%	0.82
NH 111	W. of Kimb Hill Rd	18,670	0.93	19,760	0.99	11,770	-40%	0.59
NH 3A	S. of Pelham Rd.	25,400	0.87	27,190	0.93	22,190	-18%	0.76
NH 3A	S. of Wason Rd.	39,700	0.88	42,710	0.95	31,570	-26%	0.58
Kimball Hill Rd	E. of Bush Hill Rd.	4,960	0.30	5,000	0.30	1,490	-70%	0.09
Bush Hill Rd.	S. of Speare St.	6,760	0.45	8,530	0.57	2,850	-67%	0.19
	E. of Musquash							
Wason Rd.	Rd.	9,330	0.56	10,960	0.66	4,560	-58%	0.27

NH 101A Widening (Nashua, Merrimack)

The NH 101A improvement program being implemented by the NHDOT resulted from the NH 101A Corridor Master Plan and Improvements Program (December 2002), which proposed various capacity improvements to reduce congestion, increase speeds to efficient levels and decrease vehicle miles by reducing the diversion of traffic to parallel routes.

In Nashua the highway is being widened to three travel lanes per direction in two segments: Phase 1 will include from Sunapee St. to Blackstone Drive and Phase 2 will continue the widening from Sunapee St. to Somerset Parkway and Blackstone Dr. to Celina Ave..

In Merrimack there are three NH 101A travel lanes westbound from Continental Blvd. to Boston Post Rd. and two lanes eastbound. The project will add a third eastbound lane to reduce congestion along the highway. Also, the Continental Blvd. intersection with 101A will be widened; a second lane for right turns onto 101A and a new right-turn lane from 101A westbound to Continental Blvd. will be constructed. Non-motorized travel will also be enhanced, with sidewalks, bike lanes and a signalized crosswalk across 101A at the Continental Blvd. intersection.

Traffic calming measures will also be implemented with the reconfiguration of Boston Post Rd. and Craftsman Lane, and a public right-of-way through the parking lot at the Merrimack Valley Baptist Church will be discontinued.

[illegible]

NH 101A Widening Traffic Impact

		2015 Ct	2015 V/C	2045 NB	NB V/C	2045 Bld	NB to Bld %	Bld V/C
NH 101A	E of Thornton Rd	42,310	0.85	45,370	0.91	51,020	12%	0.85
NH 101A	E of Blackstone Dr	41,250	1.03	45,160	1.13	50,510	12%	0.84
NH 101A	Bos Post Rd- Ctl Blv	41,050	0.75	46,450	0.84	49,620	7%	0.76

F.E.E. Turnpike Widening

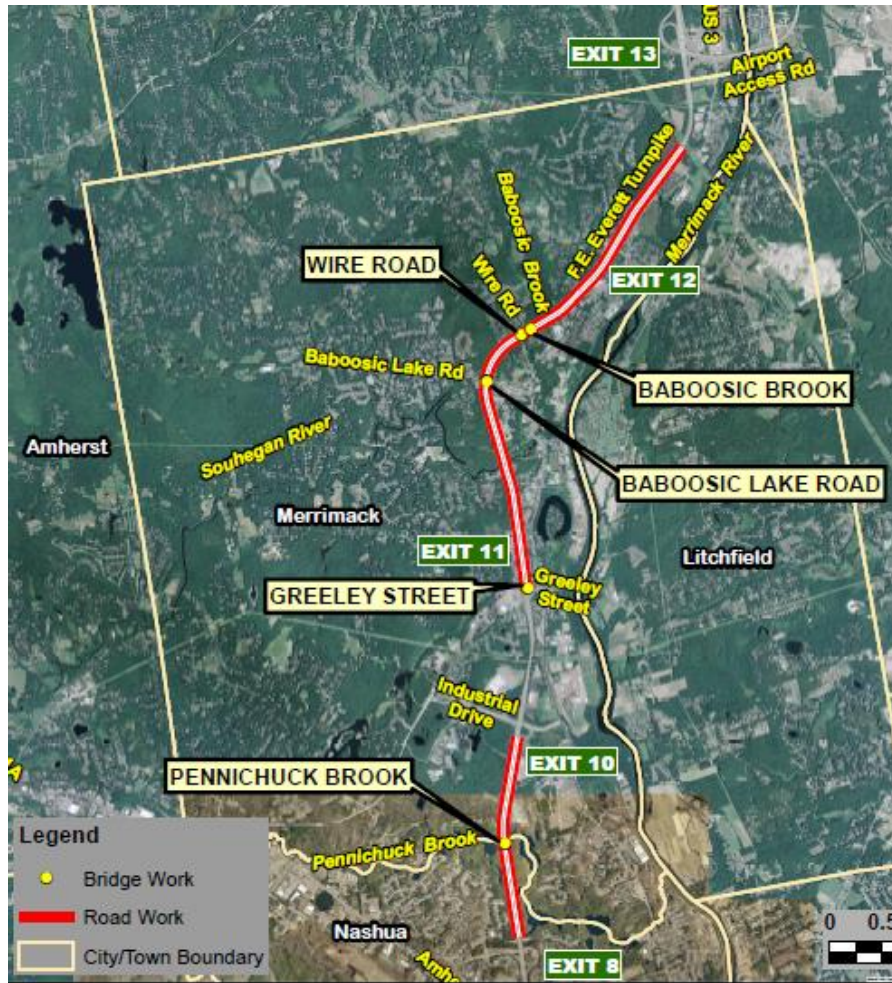
During the 1990's the F.E.E. Turnpike was widened in Nashua to a minimum of three lanes in each direction from the Massachusetts state line to Exit 7 at NH 101A, with the most travelled segment between Exits 5 and 6 having five lanes per direction. The segment between Exit 10 (Industrial Drive) and Exit 11 (Greeley Street/Continental Blvd.) in Merrimack is also 3-lanes per direction. The variable cross-section results in bottleneck conditions during peak periods, causing significant travel delay and compromising safety. The current project now about to advance to implementation would improve the following segments to 3 lanes:

- Southern Segment: Between Exits 8 and 10 in Nashua and Merrimack
- Middle Segment: From Exit 11 to the existing 3-lane section south of Exit 13 (Wieczorek Drive to Manchester Airport) in Merrimack.
- Northern Segment: From north of Wieczorek Drive to the I-293 interchange (segment outside of the NRPC region).

The project will also address bridges within the widening segments that have not been substantively improved since their construction during the 1950's. Although not on the Red List, they would require rehabilitation in the near future absent the widening program. They include:

- FEET northbound & southbound over Pennichuck Brook (Nashua/Merrimack)
- Baboosic Lake Road over FEET (Merrimack)
- Wire Rd over FEET (Merrimack)
- FEET northbound and southbound over Baboosic Brook (Merrimack)

Public information meetings have been held to solicit input from the public, resulting in additional noise mitigation measures being implemented at high impact locations. A Public Hearing was held in October 2018 which presented plans and solicited additional public input.



NH 101 Corridor Improvements (Wilton/Milford/Amherst)

NH 101 corridor improvements have been programmed into the TYP based on findings of [the New Hampshire Route 101 Corridor Plan \(September 2002\)](#). The stated purpose of the plan was to improve safety and preserve the capacity of the roadway as land use patterns change along the corridor. The recommended plan was designed to result in a better operating, more visually appealing arterial, as well as reduced traffic diversion to local streets.

NASHUA MPO RECOMMENDED FISCALLY CONSTRAINED PROJECTS

REHABILITATION/RECONSTRUCTION/OPERATIONAL IMPROVEMENTS OF EXISTING FACILITIES

Bridge Projects

The following bridge replacement or rehabilitation projects are recommended.

<u>Municipality</u>	<u>Bridge Location</u>	<u>Project Type</u>
Milford	Purgatory Rd over Purgatory Brook	Replacement
Milford	North River Rd. over Hartshorn Brook	Replacement
Nashua	Taylor Falls & Veterans Memorial Bridge	Rehabilitation

Railroad Safety Improvements

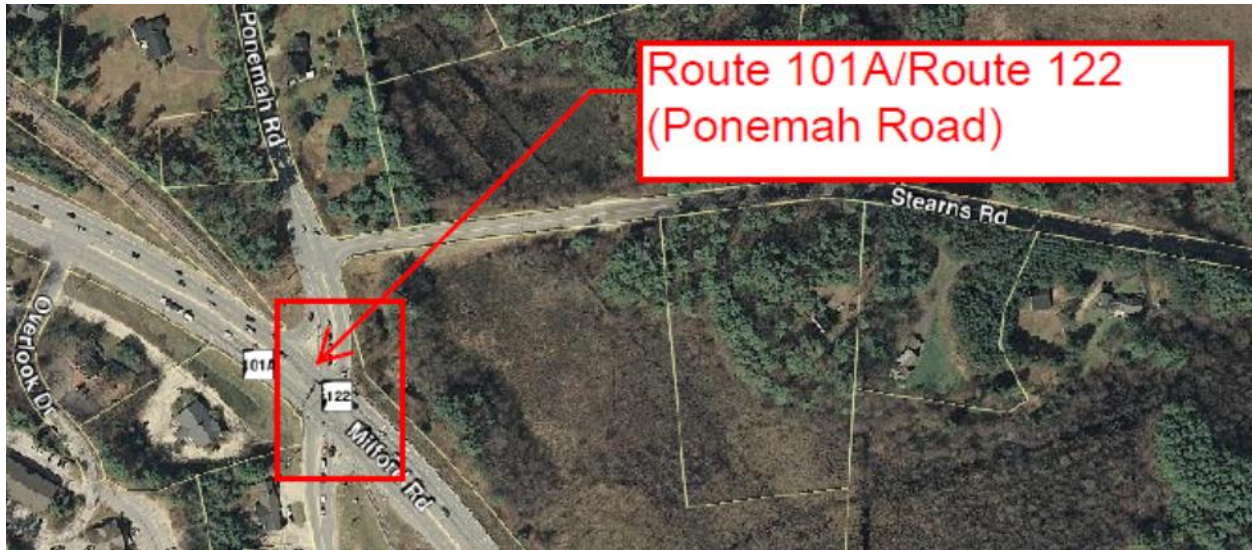
Substandard railway crossings have impacted the Nashua region in a number of locations, with incidents impacting travel safety as well as travel time reliability. The following improvements are recommended for implementation through the use of state programmatic funds.

NH 101A Railroad Crossing Improvements, Amherst

Railroad crossings at four locations on or adjacent to NH 101 are in need of reconstruction: 1) NH 101A/NH 122, 2) Old Nashua Road, 3) Northern Blvd. and 4) North Hollis Rd. The crossings are in poor condition and reconstruction will enhance safety for freight operations, as well as vehicles traveling in the project area. Consequently, the project will improve the current asset condition, minimize the potential for incursions in the areas of the crossings and improve freight mobility.

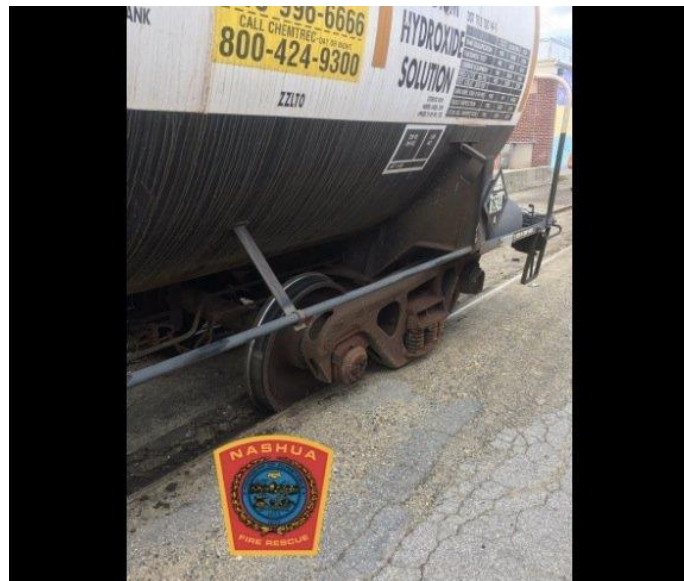
A ten-year accident history indicates 132 incidents within 250 feet in all directions from the 101A/122 intersection. There have been 30 accidents involving personal injury. A CRF of 32% reduction is applicable for installation of stop sign installation at a railroad crossing. Ease of bicycle travel will also be facilitated by the project.

NH 101A does not operate at high levels of congestion in this area; LOS C was identified in 2010 but should be re-estimated by NRPC.



Main Street, Nashua

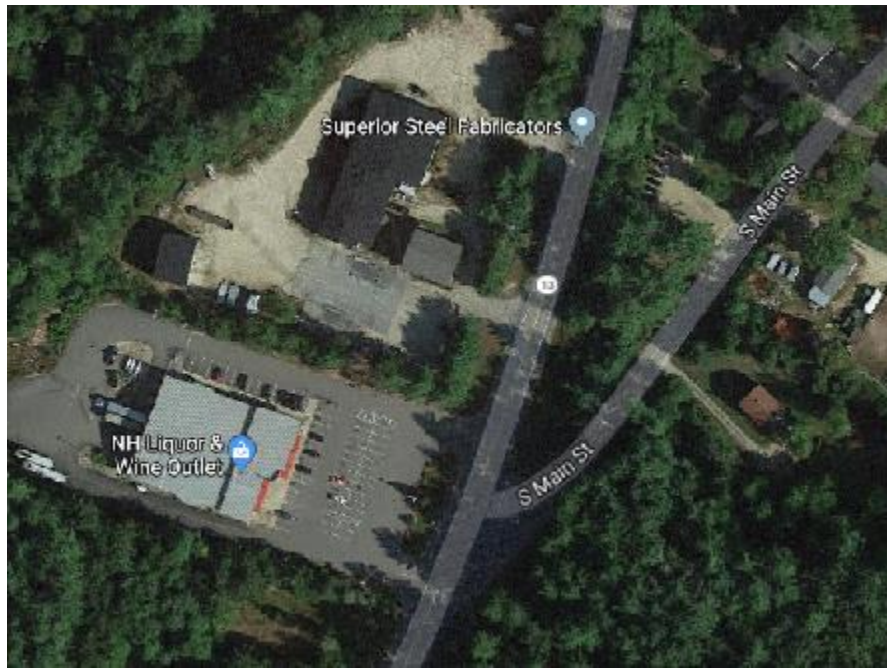
The Main Street railroad crossing in Nashua, located between the Nashua River bridge and Franklin/Canal Streets, is in substandard condition. The Road Condition Index at this location is 1.69 (poor), impacting freight travel over this crossing and contributing to wear and tear on vehicles passing over. In 2017 a train derailment at this crossing reduced traffic to one lane, causing excessive traffic delays over the primary Nashua River crossing facility in the business district. As the train was transporting a caustic chemical, the incident had potential safety implications for the surrounding area, in addition to the bottlenecked condition which resulted.



RECONSTRUCTION & OPERATIONAL IMPROVEMENTS

NH 13/South Main Street Realignment, Brookline

The project entails the realignment of NH 13 and South Main Street to a perpendicular alignment between the two streets. A consolidation of the two access points for businesses across the street into a single access point opposite South Main Street to provide a four-way intersection is also under consideration. Addition of a traffic island will provide traffic calming and better define the entrance/exit points at the intersection. The Town also requests that the State lower the speed limit in the area from 50 to 35 mph. The project is intended to address safety, as left-turning vehicles from South Main St. to NH 13 can take the obtuse angle at a high speed, posing a hazard particularly to vehicles exiting the business directly across the highway.



NH 130 (Broad Street), Nashua

The project entails reconstruction of NH 130 from Coburn Ave. to Coliseum Ave. in Nashua, as well as safety and shoulder improvements on Dublin Ave. It was added to the State's TYP in 2003 and appeared to be on tract for construction in the FY 2011 – 2014 TYP with construction in 2016; however, the project was subsequently deferred beyond 2013- 2022 TYP time frame and funds were deobligated.

The current IRI on this segment of NH 130 ranges from 217 to 268, which puts the roadway well below the acceptable rating of 170.

Main Street, Nashua

This project, first identified in the 2004 Downtown Master Plan, would reconstruct Main Street from Hollis Street to Orchard Avenue, a distance of 1.09 miles. It was a programmed project as recently as the 2011 TYP, but was deferred beyond 2022 in the 2013 TYP. The reconstruction will improve vehicular safety and improve pedestrian connectivity through assisting in extending the pedestrian zone of downtown Nashua. Reconstruction would not entail a capacity increase. The roadway IRI ranges from

184 to 308 along the section, averaging 256; pavement condition in in poor condition the entire length of the project area.

The project provides benefits to the Tree Streets Neighborhood, the primary Environmental Justice zone in the region. Both vehicular and pedestrian travel from this area will be facilitated by the project.

Bridge & Canal Complete Streets Improvements, Nashua

The project begins on Canal Street at Railroad Square near Main Street and continues east over the Canal Street bridge, where the street continues as Bridge Street, toward the Merrimack River bridges. The proposed improvements include pavement replacement, adjustments to curbs and reconstruction of sidewalks and handicapped ramps. New pavement markings will re-assign the street's use in terms of travelled way, parking and bike lanes. Drainage problems will also be addressed.

The project facilitates pedestrian and bicycle travel for the surrounding neighborhood, which lies within an Environmental Justice zone.



PEDESTRIAN/BICYCLE PROJECTS

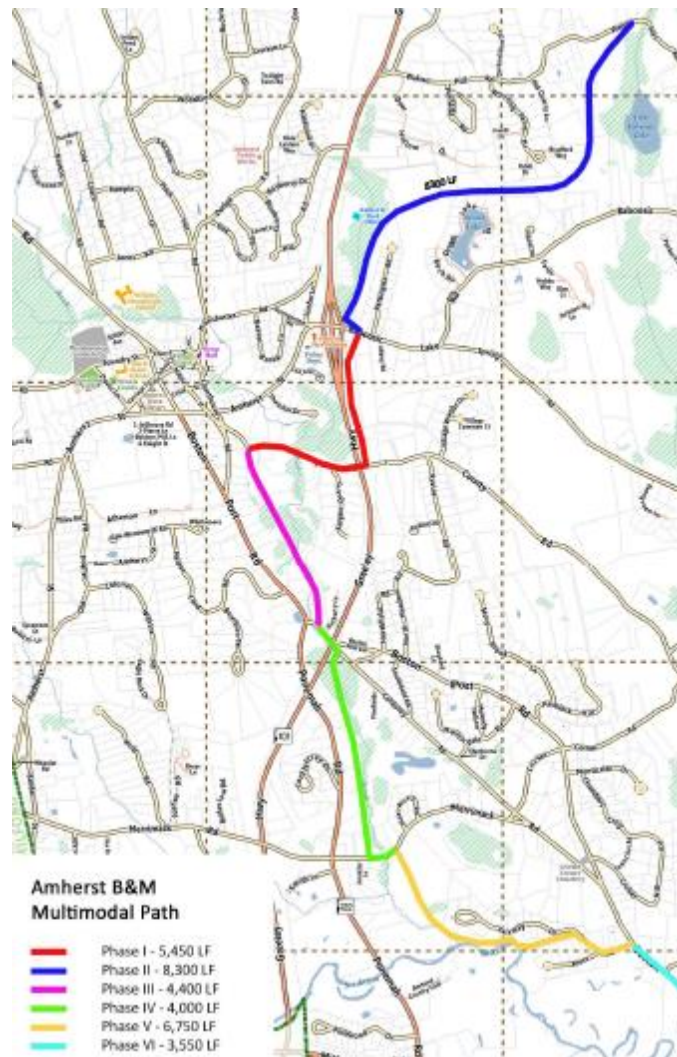
Multi-Modal Path, Amherst

The project utilizes abandoned B&M Railroad property as well as Town owned property to provide a future continuous non-motorized path over six miles in length running north to south in Amherst. The Town has adopted the following phases for the project, with the first two planned for early implementation.

- Phase I – To be implemented with municipal funds only, a 5,450-foot section beginning to the east of the NH 101/Baboosic Lake Rd. interchange, running south to the east of NH 101, continuing west on Thornton Ferry Rd and turning south running to the west of Beaver Brook, terminating at Merrimack Rd.
- Phase 2 – This 8,300-foot segment begins at Baboosic Lake Rd. just east of the NH 101 interchange and runs northeasterly along the B&M rail corridor terminating at Walnut Hill Rd. opposite Embankment Rd. (2018 TAP submission).

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- Phase 3 – The 4,400-foot section runs from the intersection of Thornton Ferry Rd/Courthouse Rd. and runs south to Mulberry Lane at Corduroy Rd.
- Phase 4 – This 4,000-foot section continues south from Mulberry Rd. along Beaver Brook to Merrimack Rd., terminating west of Pine Acres Rd.
- Phase 5 - The 6,750-foot section begins at Merrimack Rd to the west of Pine Acres Rd and continues southeasterly along Beaver Brook and subsequently Fairway Drive, terminating at the intersection of River Rd and Boston Post Rd.
- Phase 6 – From River Rd. the southernmost 3,550-foot section continues along Boston Post Rd., terminating at the Amherst Middle School.



Merrimack Town Center Sidewalks

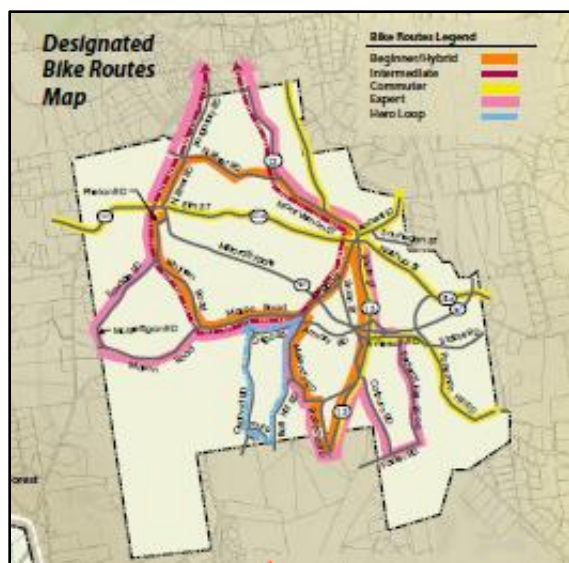
The Town of Merrimack has submitted a TAP application for construction of sidewalks on Baboosic Lake Rd. from DW Highway to O'Gara Dr. (1,500 ft.) and on Woodbury Rd. from DW Hwy. to McElwain Street

(1,200 ft.). The project connects a number of Town facilities and commercial establishments with the town center. The project will raise the nonmotorized Stress Analysis score from D- to A/B on Woodbury St. and from D/E- to A/B on Baboosic Lake Rd.



Milford Non-Motorized Improvements

In direct response to the growing community demand for safe pedestrian routes of travel to town wide destination, recreational resources/facilities, schools and within existing and expanding neighborhoods, the Town of Milford developed the Milford Pedestrian, Bicycle, Trail & Recreation Plan in 2014. The Connectivity Plan mapped existing facilities and prioritized the location of future pedestrian and bicycle paths, trails and corridors. Three specific projects have evolved for inclusion in the MTP, one of which being submitted for funding in the current TAP application round.



Various Pedestrian Linkages (TAP project)

The project would construct a 200-ft. pedestrian bridge over the Souhegan River from 135 Elm Street to 34 North River Rd. This connects to an existing nonmotorized network serving recreational programs. A 3,000 foot nonmotorized path/trail would be constructed connecting to the Keyes Memorial Park and MCAA fields. The project creates direct pedestrian linkages to the Souhegan River, existing trail system, the elementary school, a recreational center and the downtown center.

Osgood Rd. & Melendy Rd. Sidewalks

The Town has identified as a future project the construction of a sidewalk and multi-use connection for pedestrians and non-motorized vehicles beginning at the intersection of West St./Osgood Rd. extending to Adams Field and Osgood Pond and ending at the Leisure Acres mobile home Park on Melendy Rd. (3,000 ft.). The project includes new sidewalks, striped lanes, detached pathways and road crossings. The project serves a high-traffic facility that connects a municipal recreation area, the Osgood Pond natural area, a historic park and established residential neighborhoods.

NH 101A Sidewalks and Bicycle Lane

A future priority is the construction of a sidewalk and striped bicycle lanes on NH 101A Nashua Street between the Medlyn Monument and Walgreen Pharmacy (2,600 ft.).

Kinsley Street Pedestrian and Bicycle Accessibility Improvements, Nashua

The project would entail construction of new sidewalks on both sides of the entire length of Kinsley Street from the Everett Turnpike interchange to Main Street in downtown Nashua. New handicapped ramps will be provided, and a bike lane will be striped by reappropriating the road through reducing shoulders or on-street parking. With its high rate of speed Kinsley Street is a dangerous facility for bicycle travel and substandard sidewalks adversely impact pedestrian activity.

Lock & Whitney Streets, Nashua

Lock and Whitney Streets are predominant routes to Mt. Pleasant Elementary School in Nashua's French Hill neighborhood. Walking is a primary mode to school in this densely populated area. The project will improve nonmotorized transportation in the neighborhood by widening existing sidewalks to a minimum of five feet to enable all mobility devices to comfortably use the sidewalks. Striped bike lanes will also be added to the streets. To accommodate both the sidewalk widening and bike lanes, both streets will be converted to one-way, with travel lanes narrowed and traffic calming at busy intersections to improve safety.

The project is in the most densely populated Census Tract (#105) in the City and has the third highest minority population rate in the City at 38% and second highest poverty rate at 29%.

NH 3A and NH 102 Non-Motorized Improvements, Hudson

The Town of Hudson has included the completion of non-motorized gap sections on NH Routes 3A Lowell Rd. and 102 Derry Rd. The Phase 2 project on NH 102 would continue the pedestrian/bike lane from Towhee Dr. to Megan Dr. and Phase 3 from Phillips Dr. to the Hudson Mall. On NH 3A sidewalks would be continued from Birch St. to Pelham Rd. The projects have been in the MTP for a number of years; however, the Town has not moved toward implementation through a Transportation Alternatives Program application. The Board of Selectmen affirmed the projects as future goals and it is recommended that the Town pursue TAP funding for one or more segments in the next application round.

HIGHWAY CAPACITY ENHANCING PROJECTS

Broad Street Parkway Interchange with Franklin Street

The Broad Street Parkway, completed in late 2015, provided an additional Nashua River crossing linking NH 130 Broad Street east of the Turnpike Exit 6 interchange with Pine Street in the vicinity of the Mill yard Technology Park. It currently carries about 9,600 vehicles per day but has not reached its full potential to date due to lack of access to city streets between its origin and end points. A project which will be added to the State's TYP in the next round per agreement between the City of Nashua and the State is an interchange with Franklin Street, thereby providing access to roadways north of the Nashua River.

Broad Street Parkway/Franklin St. Interchange Traffic Impact

		2015 Ct	2015 V/C	2045 NB	NB V/C	2045 Bld	NB to Bld %	Bld V/C
Broad St Pkwy	S. of Fairmount St	9,580	0.38	10,270	0.41	13,470	31%	0.54
Main St.	S. of Franklin St.	23,730	0.79	24,400	0.81	23,170	-5%	0.77
Franklin St.	E. of Charles St.	1,580	0.10	1,770	0.11	3,260	84%	0.20

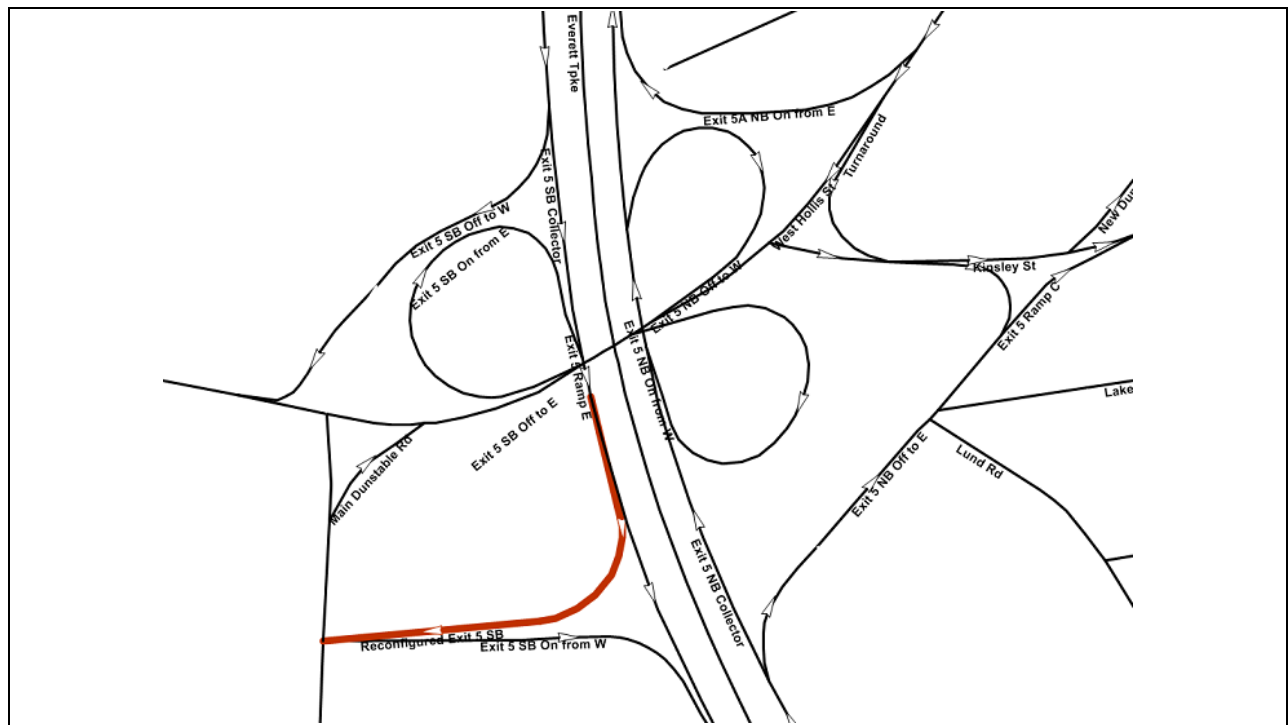
FEE Turnpike Exit 5 Reconfiguration

The project addresses traffic and safety related issues for traffic exiting the turnpike at exit 5E onto the overhead West Hollis Street on ramp to travel to the east toward downtown. This traffic competes with eastbound traffic from West Hollis and Main Dunstable Road. All eastbound traffic converges at a very

short weave section on West Hollis Street between the turnpike southbound off ramp and the turnpike northbound on ramp and is further exacerbated by the conflict between turnpike off-ramp traffic to West Hollis Street and northbound turnpike on-ramp traffic. The 500-ft. weave section along West Hollis Street is too short for the conflicting traffic movements. Queues back up on the ramp during peak periods to the southbound turnpike collector-distributor roadway segment.

The proposed project would realign the Exit 5E Southbound off ramp with the traffic signal at the junction of Main Dunstable Road and the turnpike southbound on ramp. This approach would eliminate the exit from the southbound turnpike traffic onto West Hollis Street. Traffic would exit the turnpike onto Main Dunstable Road and turn right onto West Hollis Street from Main Dunstable Road where two right turn lanes exist.

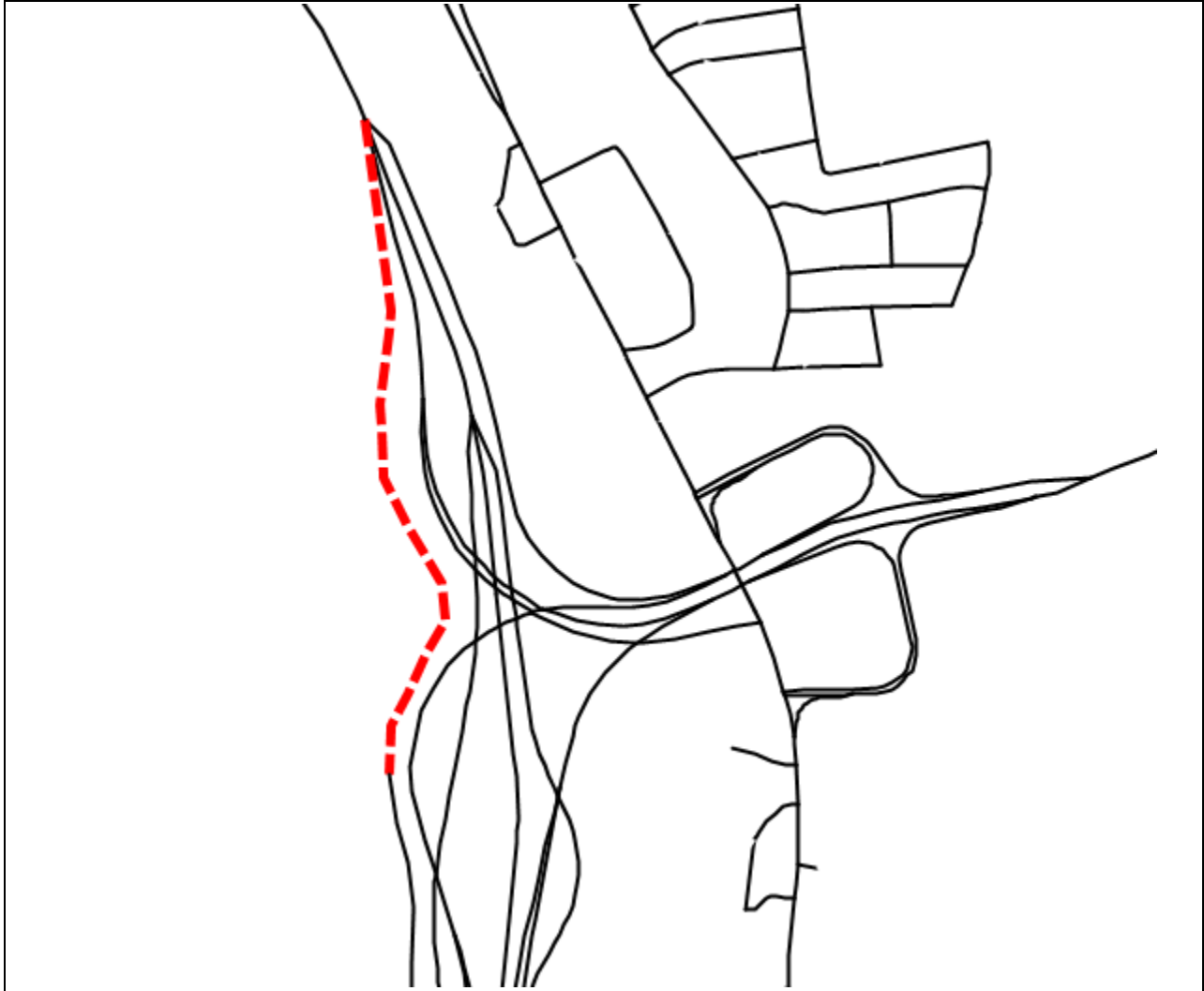
Turnpike Exit 5 Reconfiguration, Nashua



FEE Turnpike Ramp to Dozer Road, Nashua

The City of Nashua has identified as a future priority the construction of a new turnpike southbound off-ramp at Exit 2 to Innovative Way. By providing an alternative to Exit 1 for destinations west of the turnpike, including the developed area along Innovative Way and Tara Boulevard, as well as dense residential complexes south of Spit Brook Road, the heavily congested segment of Spit Brook Rd. west of the turnpike would be mitigated. The project would improve vehicular access for the EJ residential area in South Nashua.

Turnpike Exit 2 Off-Ramp to Dozer Road, Nashua



Turnpike/Dozer Rd Southbound Ramp Traffic Impact

		2015 Ct	2015 V/C	2045 NB	NB V/C	2045 Bld	NB to Bld %	Bld V/C
FEE Tnpk SB	S. of Exit 2	59,700	1.02	60,670	1.04	57,380	-5%	0.98
Spit Brook Rd.	W. of Turnpike	25,450	0.81	28,980	0.92	26,140	-10%	0.83
Dozer Rd Ramp		--	--	--	--	4,270	--	0.28

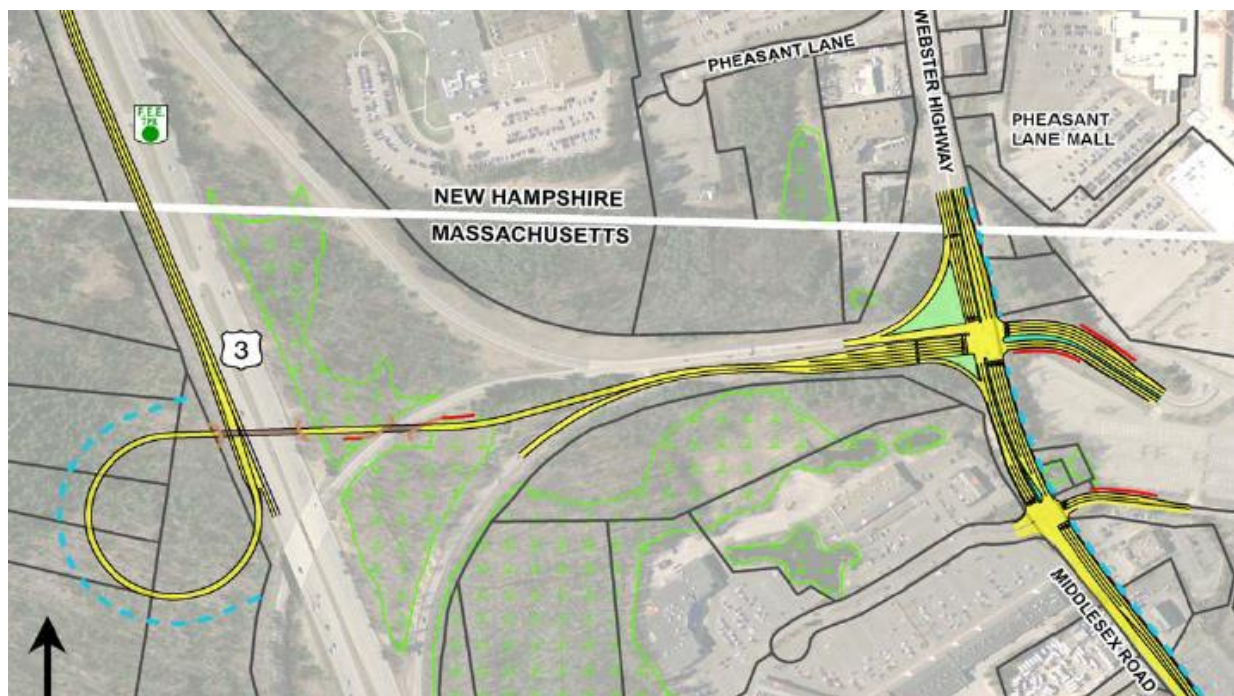
US 3 Exit 36 Interchange

Proposed is a southbound exit from the F.E.E. Turnpike to Daniel Webster Highway in the densely developed commercial and residential area of South Nashua. The existing configuration of the interchange provides for all movements except for southbound turnpike traffic. Drivers traveling to this area from points north via the Turnpike must exit at Spit Brook Rd. and traverse that congested roadway to access South Nashua. A joint study was conducted by NRPC and the Northern Middlesex Council of Governments to identify project benefits and estimated costs.

The Exit 36S off ramp is expected to significantly improve operating conditions along the major roads in the south Nashua area, by relieving traffic congestion and delay, reducing greenhouse gas emissions, improving travel times, and decreasing lost productivity. The project is expected to enhance the effectiveness of public transportation and supports future passenger rail service. The southbound ramp and related improvements will provide more efficient access to services, area business establishments, and local and regional job centers. The proposed improvements will also generate opportunities for sustainable growth and serve as a catalyst for future economic development and community investment. The bi-state aspect of the project provides exceptional opportunities for innovative financing, interstate cooperation and coordination, and public/private partnerships.

South Nashua in the vicinity of the project is an EJ target area, with a minority population exceeding 20%; however, the ramps would be built south of the state line in Massachusetts, away from the dense residential area in Nashua west of Daniel Webster Highway. Impacts to the South Nashua community would therefore be limited. There may be increases in ambient noise but will be mitigated should the project go forward. Improved enhanced pedestrian and transit connections are recommended in conjunction with the project, which would benefit South Nashua's EJ population.

US 3 Exit 36 Off-Ramp to South Nashua



Exit 36 Southbound Off-Ramp Traffic Impact

		2015 Ct	2015 V/C	2045 NB	NB V/C	2045 Bld	NB to Bld %	Bld V/C
Spit Brook Rd	E. of Turnpike	27,690	0.88	27,750	0.88	24,900	-10%	0.79
DW Hwy.	S of Spit Brook Rd	30,690	0.78	29,420	0.74	22,540	-23%	0.57
Exit 36 SB Ramp						11,750		0.90

2045 BUILD TRAFFIC FORECASTS – REGIONAL ANALYSIS

The 2045 Build scenario includes all capacity enhancing projects included in the State's TYP, as well as those which are recommended for implementation by the MPO and determined to be fiscally constrained. The latter category includes:

- Hudson Boulevard
- Broad Street Parkway interchange with Franklin Street
- Turnpike Exit 5 Reconstruction
- Turnpike southbound off-ramp to Dozer Road
- Exit 36 SB off-ramp

Projects which enhance safety, involve reconstruction, bicycle/pedestrian improvements or localized intersection capacity improvements are not modeled, as the impact on network capacity and speeds is minimal.

Illustrative highway projects, although capacity-enhancing, have been determined not to be fiscally constrained recommended projects and are not modeled. These include:

- NH 101 interchange at Perry Road, Milford
- Northern Merrimack River Crossing connecting FEE Turnpike with US 3, NH 3A and NH 102
- NH 101 widening to four-lane cross-section

The assignment of all future projects produces the statistical summary shown in the following table. Vehicle miles of travel declines at an insignificant level, but the relevant statistic is the change in vehicle hours of travel, as it measures the change in congestion and travel delay. There is a 3.5% decrease in VMT resulting from the recommended highway improvement program. This will also translate to reductions in fuel use and air emissions.

Highway Assignment Summary, 2045 No-Build & Build

	2045 No-Build	2045 Build	% Change NB to Bld
Vehicle Trips	1,371,531	1,371,531	0.0%
Veh. Miles Traveled	11,678,157	11,672,504	0.0%
Veh. Hours Traveled	452,067	435,255	-3.7%
Ave Trip Length (Mi.)	8.51	8.51	0.0%
Ave Trip Time (Min.)	19.78	19.04	-3.7%

**2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects**

2045 Traffic Forecast: Build Highway Network

Highway	Location	2045 NB Volume	NB V/C	2045 Bld Volume	% NB to Build	Bld V/C
Taylor Falls Bridge	Nashua/Hudson T/L	40,770	1.13	36,260	-11.1%	1.01
Sagamore Bridge	Nashua/Hudson T/L	56,020	0.72	63,760	13.8%	0.82
FEE Turnpike	Mass. S/L	93,330	0.80	91,980	-1.4%	0.79
FEE Turnpike	B/t Interchange 2 & 3	117,290	0.67	125,470	7.0%	0.71
FEE Turnpike	B/t Interchange 4 & 5	120,430	0.69	126,850	5.3%	0.72
FEE Turnpike	B/t Interchange 5 & 6	152,100	0.78	156,030	2.6%	0.80
FEE Turnpike	B/t Interchange 7 & 8	101,830	0.58	112,040	10.0%	0.64
FEE Turnpike	b/t Interchange 8-10	83,740	1.07	96,940	15.8%	0.83
FEE Turnpike	B/t Interchange 10 & 11	75,770	0.65	84,360	11.3%	0.72
FEE Turnpike	B/t Interchange 11 & 12	75,130	0.96	82,440	9.7%	0.70
FEE Turnpike	B/t Interchange 12 & 13	64,350	0.82	68,010	5.7%	0.58
FEE Turnpike	Bedford Tolls	49,750	0.64	52,130	4.8%	0.45
NH101 - Wilton	W. of Wilton Center Rd	10,550	0.50	10,550	0.0%	0.50
NH101 - Milford	E. of Wilton Rd	24,330	0.93	24,350	0.1%	0.93
NH101 - Milford	W. of NH13	21,230	0.71	21,730	2.4%	0.72
NH101 - Milford	E. of NH13	28,800	0.96	29,100	1.0%	0.97
NH101 - Amherst	N. of Baboosic Lake Rd	22,340	0.74	21,040	-5.8%	0.70
NH101 - Amherst	Bedford T/L	20,810	0.69	19,940	-4.2%	0.66
NH101A - Milford	W. of Old Wilton Rd	7,770	0.47	7,780	0.1%	0.47
NH101A - Milford	E. of Cottage St	16,320	0.98	16,530	1.3%	1.00
NH101A - Milford	E. of Oval	13,190	0.82	14,040	6.4%	0.88
NH101A - Amherst	E. of NH122	32,110	0.80	32,320	0.7%	0.81
NH101A - Merrimack	Hollis T/L	39,510	0.99	41,150	4.2%	1.03
NH101A - Merrimack	Nashua T/L	48,080	0.77	51,100	6.3%	0.82
NH101A - Nashua	E. of Thornton Rd	45,370	0.91	51,020	12.5%	0.85
NH101A - Nashua	E. of Henri Burque	25,370	0.45	26,840	5.8%	0.47
NH101A - Nashua	W. of Main St	20,580	0.72	20,370	-1.0%	0.71
NH130 - Brookline	Milford St east of NH13	3,340	0.20	2,620	-21.6%	0.16
NH130 - Hollis	at Hollis T/L	6,980	0.42	7,120	2.0%	0.43
NH130 - Nashua	at Nashua C/L	9,310	0.62	9,170	-1.5%	0.61
NH130 - Nashua	west of FEET	41,610	1.05	41,440	-0.4%	1.05
NH130 - Nashua	west of NH101A	13,420	0.89	11,840	-11.8%	0.79
NH111 - Hollis	Mass S/L	8,820	0.52	8,590	-2.6%	0.51
NH111 - Nashua	Hollis T/L	10,990	0.65	10,840	-1.4%	0.64
NH111 - Nashua	over FEET	49,160	0.91	47,790	-2.8%	0.89
NH111 - Nashua	Kinsley St W. of Ritter St	11,970	0.72	10,940	-8.6%	0.66
NH111 - Nashua	Hollis St. W. of Main St	11,160	0.80	10,160	-9.0%	0.73
NH111 - Nashua	Hollis St. E. of Main St	10,960	0.88	10,590	-3.4%	0.76
Nh111 - Hudson	E. of Library St	15,130	0.84	13,190	-12.8%	0.73
Nh111 - Hudson	Windham T/L	16,950	0.85	19,560	15.4%	0.98

**2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects**

2045 Traffic Forecast: Build Highway Network, continued

Highway	Location	2045 NB Volume	NB V/C	2045 Bld Volume	% NB to Build	Bld V/C
Main Street - Nashua	S. of Amherst St	22,990	1.02	23,180	0.8%	1.03
Main Street - Nashua	over Nashua River	24,390	0.81	23,290	-4.5%	0.78
Main Street - Nashua	N. of Hollis St	18,740	0.62	18,610	-0.7%	0.62
Main Street - Nashua	S. of Hollis St	17,330	0.58	17,740	2.4%	0.59
NH3A - Hudson	Mass S/L	7,290	0.44	5,780	-20.7%	0.35
NH3A - Hudson	S. of Rena St	29,570	0.90	27,950	-5.5%	0.85
NH3A - Hudson	S. of Wason Rd	42,960	0.95	31,810	-26.0%	0.59
NH3A - Hudson	N. of Ledge Rd	27,280	0.91	26,280	-3.7%	0.88
NH3A - Hudson	S. of Derry Lane	10,140	0.61	9,140	-9.9%	0.55
NH3A - Litchfield	Manchester C/L	13,600	0.80	12,650	-7.0%	0.74
NH38 - Pelham	Mass S/L	14,200	0.79	14,070	-0.9%	0.78
NH38 - Pelham	Salem, NH T/L	13,900	0.84	13,700	-1.4%	0.83
NH128 - Pelham	Mass S/L	11,390	0.69	10,250	-10.0%	0.62
NH128 - Pelham	N. of Sherburne Rd	16,450	0.99	13,690	-16.8%	0.82
NH128 - Pelham	Windham T/L	6,350	0.38	4,610	-27.4%	0.28
DW Highway - Nashua	Mass S/L	19,300	0.41	16,240	-15.9%	0.34
DW Highway - Nashua	S. of Sagamore Bridge	21,210	0.67	16,760	-21.0%	0.53
US3/Henri Burque	W. of Manchester St	14,830	0.82	14,840	0.1%	0.82
DW Highway - Nashua	Merrimack T/L	13,220	0.80	10,370	-21.6%	0.62
DW/US3 - Merrimack	N. of Manchester St	16,010	0.53	11,680	-27.0%	0.39
DW/US3 - Merrimack	N. of Industrial Dr.	12,930	0.43	12,450	-3.7%	0.42
DW/US3 - Merrimack	S. of Bedford Rd	17,050	1.14	16,970	-0.5%	1.13
NH13 - Brookline	Mass S/L	6,400	0.39	6,240	-2.5%	0.38
NH13 - Milford	S. of NH101 bypass	13,470	0.79	12,930	-4.0%	0.76
NH13 - Milford	N. of NH101 bypass	6,090	0.36	6,000	-1.5%	0.35
NH13 - Mont Vernon	Mont Vernon T/L	3,310	0.19	3,270	-1.2%	0.19
NH31 - Mason	Mass S/L	2,810	0.17	2,460	-12.5%	0.14
NH31 - Wilton	S. of NH101	3,450	0.20	3,760	9.0%	0.22
NH31 - Wilton	downtown Wilton	3,040	0.18	3,010	-1.0%	0.18
NH31 - Lyndeborough	Greenfield T/L	2,780	0.16	2,800	0.7%	0.16
NH122-Hollis	at Mass S/L	2,630	0.15	2,730	3.8%	0.16
NH122-Hollis	at Amherst t/l	5,470	0.32	5,120	-6.4%	0.30
NH122-Amherst	s. of Baboosic Lake Rd	8,560	0.50	8,380	-2.1%	0.49
NH 102-Hudson	N. of Ferry St	17,600	0.88	16,410	-6.8%	0.82
NH 102-Hudson	Hudson/Londonderry T/L	14,890	0.90	13,810	-7.3%	0.83
NH 102-Hudson	Litchfield/Hudson T/L	18,510	1.12	17,120	-7.5%	1.03

ILLUSTRATIVE PROJECTS

An Illustrative project is defined by USDOT as "an additional transportation project that may (but is not required to) be included in a financial plan for a metropolitan transportation plan, TIP or STIP if reasonable additional resources were to become available." The NRPC MTP includes the following projects which have been identified as regional priorities, but which cannot be reasonably fitted into a fiscally constrained plan.

Northern Merrimack River Crossing

This project is the northernmost component of the proposed Circumferential Highway, a project long proposed but removed from the State's TYP years ago due to environmental and cost considerations. The only segment completed was the Exit 2 interchange from the Turnpike to DW Highway in Nashua and NH 3A in Hudson. The section between NH 3A and NH 111 continues as a locally-funded project in the TYP. The remaining MTP illustrative project connects to the Turnpike at a new Exit 9 and extends across the river to NH 3A in southern Litchfield and NH 102 in Hudson.

The opening of the Raymond Wieczorek Drive in 2011 provided a bridge crossing from I-293 in southern Bedford. This bridge primarily improves access to the Manchester-Boston Airport, as well as for travel to the north on the west side of the Merrimack River from NRPC communities east of the river. However, it does not have the impact of relieving traffic congestion on the Taylor Falls Bridge as would a bridge between Merrimack and Litchfield.

A project cost of \$295 million is estimated for implementation over the 2038 to 2045 time frame. The previous MTP assumed a 50/50 split between federal and turnpike revenues; however, under current funding assumptions, neither source will be able to provide the needed funding amounts within the current MTP time frame.

NH 101 Bypass Interchange to Perry Road, Milford

This project would construct a new full access interchange from NH 101 to the east of the Perry Road underpass, in order to provide access to under-developed town and privately-owned properties planned for commercial/industrial and mixed-use development in West Milford. The project does not substantively impact existing congestion or safety issues in the project area. However, development proceeding under the existing network would increase these concerns at the NH 101/Phelan Rd. intersection, along Old Wilton Rd. and its intersection with Perry Rd. The project would have positive economic impacts, provide additional connectivity within the town and increase freight mobility.

NH 101 Capacity Improvements, Wilton-Milford-Amherst

The 2002 NH Route 101 Corridor Plan resulted in the programming of funds in the TYP for the improvement program that was detailed previously in this chapter. Most of the specific improvements remain in the developmental phase but have the primary purpose of improving safety rather than capacity along the highway. The Plan did state that "ultimately, Route 101 should have four travel lanes (two in each direction) from Route 114 in Bedford to western Milford, with a landscaped median (not a barrier) to control left turns." The NRPC MTP has included this widening project in its list of recommended fiscally constrained program. In this MTP update we are changing the project's status to illustrative, as we do not find that the estimated \$80 million cost would fit within projected federal revenues over the next 25-year period. As growth has slowed considerably in the region since the time the 2002 study was completed, and our future forecasts do not indicate a return to high levels of traffic

growth for the corridor, we question the need for doubling the capacity on NH 101. In recognition that acceleration of economic growth in the region or state would significantly impact this important east-west highway, we maintain capacity expansion as an illustrative project. The most important element may well be the construction of the median as a safety measure, as two-way high-speed travel along the highway creates the potential for catastrophic accidents.

Passenger Rail Service

The potential for extending passenger rail service from Lowell to Nashua and points north has been considered by the MPO going back to the original Passenger Rail Feasibility Study of 1988. That was followed by an Operational Alternatives study in 1990 and a Major Investment Study in 1999. These studies estimated ridership, operational schedules, capital costs and potential funding sources for service alternatives. Following completion of the MIS, the process of environmental assessment was begun, which was completed in 2004.

In 2007 New Hampshire established the NH Rail Transit Authority (NHRTA), which was given the primary responsibility of establishing and overseeing the operation of passenger rail service in the state. The initial focus of the NHRTA was the proposed Capitol Corridor, connecting Concord with Boston via Manchester and Nashua on the MBTA Lowell Line. In December 2014 the NH Capitol Corridor & Transit Alternatives Analysis report was released, which evaluated the following rail alternatives.

- Nashua Minimum Commuter Rail – Extend Lowell line rail service to a South Nashua terminus. This was the lowest cost rail alternative evaluated.
- Manchester Regional Commuter Rail – Service would continue north of Nashua to downtown Manchester. The study identified this as the most cost-effective initial option.
- Intercity 8 – This alternative extends service to Nashua, Manchester and Concord, similar to the Amtrak Boston-Portland Downeaster service. It was the lowest cost of intercity alternatives evaluated.

Estimated capital costs, operating and maintenance costs and estimated ridership for each alternative is shown in the following table.

In 2018 NRPC conducted an analysis at the request of the TTAC to evaluate the traffic impact of passenger rail on FEE Turnpike traffic. The following table estimates the auto trip reduction at each new rail station based on the Capitol Corridor Study estimates for the opening year. It is based on rail ridership estimates for the Manchester Regional Commuter Rail Alternative.

The second column factors these estimates to 2045 by 20%, the same growth rate applied earlier to traffic volumes. The next two columns apply the Table 2 peak hour percentages to calculate peak boardings in the AM and alightings in the PM. The bus-to-rail reductions are then applied, and the final two columns present the vehicle reductions resulting from rail trips at the four new stations. These total 393 in the AM hour for southbound trips and 342 in the PM for northbound trips.

Although the rail project status remains illustrative, or without identified funding for the MTP horizon timeline, the Nashua MPO has undertaken action to elevate the priority level of the passenger rail initiative. In June 2017 the NRPC voted to support the City of Nashua's efforts to explore the feasibility of an incremental approach to implementing passenger rail along the entire Capitol Corridor

Estimated Cost and Ridership, Passenger Rail Service Alternatives

	Manchester Regional	Nashua Minimum	Intercity 8
Rail/Signal Upgrade	\$69.2	\$31.7	\$96.3
Bridges	\$10.7	\$2.1	\$15.4
Stations	\$20.8	\$6.3	\$18.7
Layover Yards	\$12.4	\$13.4	\$4.8
Constr Allow/Staff	\$24.9	\$11.8	\$30.0
Land	\$5.9	\$7.8	\$7.5
Contingency	\$50.0	\$25.6	\$60.5
Rolling Stock	\$33.2	\$20.5	\$23.3
Trackage Rights	\$18.0	\$0.9	\$0.0
Total Capital Costs	\$245.1	\$120.1	\$256.5
Yearly Operating & Maintenance Costs	\$10.8	\$4.1	\$7.7
New Passenger Trips	3,130	1,170	1,460

Estimated Vehicle Trip Reductions from Passenger Rail Service

	<u>Rail Boardings</u>		<u>Estimated 2040</u>		<u>Bus to Rail Mode Shift</u>		<u>Auto Trips Reduced</u>	
	2015	Est 2040	AM SB	PM NB	AM SB	PM NB	AM SB	PM NB
	<u>Daily</u>	<u>Daily</u>	<u>Pk Hr</u>	<u>Pk Hr</u>	<u>Pk Hr</u>	<u>Pk Hr</u>	<u>Pk Hr</u>	<u>Pk Hr</u>
Manchester	270	324	73	65	13	14	60	51
Bedford/MHT	280	336	76	67	0	0	76	67
Nashua	420	504	113	101	6	8	107	93
South Nashua	<u>590</u>	<u>708</u>	<u>159</u>	<u>142</u>	<u>9</u>	<u>10</u>	<u>150</u>	<u>132</u>
	1560	1872	421	374	28	32	393	342

Table 5 tracks the vehicle reductions along the turnpike, which are dependent upon which station the new rail user accesses. From Manchester and Bedford, vehicle trips are reduced along the entire stretch of the highway. Those driving to downtown Nashua would impact the turnpike primarily south of Exit 7. Most rail riders at south Nashua would use Exit 1 for access and hence would reduce volume only south of this location, although there could be up to 20% in the south Nashua area that access via D.W. Highway for rail and currently travel the turnpike for their trip.

Along the maximum vehicle reduction segment on US 3, south of the state line, a 6.6% reduction in vehicles southbound in the AM peak is calculated and a 5.5% reduction for PM peak northbound vehicles.

Estimated Turnpike Traffic Reduction from Diversion to Passenger Rail

AM Peak Hour Southbound			FEE Turnpike Interchange Segment							Mass
Rail Station	13 to 12	12 to 11	11 to 10	10 to 8	8 to 7	7 to 6	6 to 5	5 to 4	4 to 2	SL
Manchester	60	60	60	60	60	60	60	60	60	60
Bedford/MHT	76	76	76	76	76	76	76	76	76	76
Nashua	0	0	0	0	50	80	90	107	107	107
South Nashua	0	0	0	0	0	0	0	0	30	150
Veh. Reduced	136	136	136	136	186	216	226	243	273	393
2040 Veh w/o rail	3,132	4,637	4,570	5,107	6,115	7,459	9,092	7,123	6,854	5,914
2040 Veh w/rail	2,996	4,501	4,434	4,971	5,929	7,243	8,866	6,880	6,581	5,521
Pct. Reduction	4.3%	2.9%	3.0%	2.7%	3.0%	2.9%	2.5%	3.4%	4.0%	6.6%

PM Peak Hour Northbound			FEE Turnpike Interchange Segment							Mass
Rail Station	12 to 13	11 to 12	10 to 11	8 to 10	7 to 8	6 to 7	5 to 6	4 to 5	2 to 4	SL
Manchester	51	51	51	51	51	51	51	51	51	51
Bedford/MHT	67	67	67	67	67	67	67	67	67	67
Nashua	0	0	0	0	45	70	80	93	93	93
South Nashua	0	0	0	0	0	0	0	0	30	132
Veh. Reduced	118	118	118	118	163	188	198	211	241	343
2040 Veh w/o rail	3,299	4,885	4,814	5,381	6,443	7,859	9,579	7,505	7,222	6,230
2040 Veh w/rail	3,181	4,767	4,696	5,263	6,280	7,671	9,381	7,294	6,981	5,887
Pct. Reduction	3.6%	2.4%	2.5%	2.2%	2.5%	2.4%	2.1%	2.8%	3.3%	5.5%

TRANSIT IMPROVEMENTS

Currently, approximately 58 percent of residents in the Nashua Region do not enjoy access to fixed-route transit, which does not extend beyond Nashua's boundaries. The three most promising candidates for extended transit service in the region are Hudson, Merrimack and Milford. Hudson has been previously identified by NRPC's Transit Plan for the Nashua Region as having the highest overall need for transit service.

To further investigate the potential for service extensions, a Nashua Regional Transit Expansion Study was initiated by NRPC in coordination with the Nashua Transit System in 2018. This ongoing study is evaluating the following specific transit route extensions:

- NH 101A between Nashua and Milford – CMAQ funds have been approved for continuing a pilot service along NH 101A which extends transit service to Wal-Mart in Amherst. This will provide for an additional three years of service (through FY2021) to Wal-Mart, but not beyond. The feasibility study will look at the results of this pilot project and evaluate extending transit service to points west of Wal-Mart along the region's most heavily congested east-west roadways and one of its busiest commercial corridors. In addition to maintaining service to Wal-Mart, the

route would be extended to serve P.C. Connection, the St. Joseph Medical Center in Milford and a number of retail and residential centers. The route would also provide access to downtown Milford, a mixed-use area representing the largest concentration of residences outside of Nashua. A component of the feasibility study will be to identify sources of funding for extending the route beyond Wal-Mart. Approximately 48 percent of all households in Milford are located within one half-mile of the downtown area.

- Continental Boulevard and Daniel Webster Highway, Merrimack – Merrimack's largest employers are situated in the southern areas of the municipality zoned for industrial uses. The Anheuser-Busch Brewery, BAE Systems, Fidelity Investments, Thomas More College and the Merrimack Premium Outlets are located along Industrial Way or DW Highway in the southern quadrant of the town. According to the NH Economic and Labor Market Bureau, these six enterprises employ more than 8,400 people. Additionally, the Outlets are a major regional destination for retail shopping. NTS does not serve any of these locations because there are no NTS routes along Continental Boulevard, Daniel Webster Highway (in Merrimack) or Industrial Way. However, these locations are all within approximately two miles of the Nashua city line and an area already served by NTS Route 1 along Manchester and Concord Streets. Extension of Route 1 to Merrimack's activity centers will be explored by the feasibility study.
- NH 3A in Hudson - The extension of NTS Routes 6 and 6A into Hudson would serve a number of major destinations, including Wal-Mart, the Hudson Technology Park and Market Basket. It would also service schools and residential areas, including Nottingham West Elementary School, the Preservation of Mary Catholic School and Convent, the Fox Hollow residential development and the densely populated neighborhoods surrounding Hudson's town center, then return to Nashua via the Taylor Falls Bridge.

The project is also investigating the potential for transit connections between NTS and other regional transit providers, which could improve access between Nashua, Manchester, Derry and Salem.

A survey of on-board riders was conducted in 2018 to identify unmet needs of current users of NTS. As noted in the Existing Conditions chapter, NTS riders favor continuing the service to Wal-Mart in Amherst and a significant portion desire service to Manchester-Boston Airport. A survey of the general public and various social service agencies and major employers is being undertaken to evaluate transit needs beyond Nashua's borders. This will be followed by Transit Planning Charettes, which will give the public an opportunity to interact with the planning process. NRPC will develop ridership forecasts, cost estimates and potential funding sources for new service alternatives.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is the application of strategies and policies to reduce travel demand or to redistribute from congested to lesser congested times of the day. It can be a cost-effective alternative to increasing capacity and also has the potential to deliver better environmental outcomes, improved public health and stronger, more prosperous, communities. TDM techniques link with and support community movements for sustainable transport.

NRPC and other MPOs will be partnering with the State of New Hampshire over the next year to implement TDM programs through the I-93 Community Technical Assistance Program (CTAP). Specific regionally-based TDM services to be provided to employers and communities include the following:

- Assist employers and employees in signing up for ride-matching services and provide follow-up services as needed.
- Conduct employer site assessments to develop and implement strategies on improving employer and employee transportation options.
- Provide geocoding, mapping and survey services to assist employers to manage parking and traffic and connect employees to services.
- Provide trip planning assistance to employees.
- Assist employers with established preferred parking, transit pass, parking cash out, alternative/flex scheduling and tax benefit programs for employees.
- Assist employers and employees in establishing and growing vanpool programs.
- Conduct park and ride and bike/pedestrian counts to identify and track trends.
- Develop/support and promote emergency ride home programs.

NRPC intends to continue the efforts that are being initiated through the CTAP program to a regionwide ongoing program that encourages businesses and their employees to reduce their commute times and costs through TDM measures that work for them. Particular emphasis will be on development of programs which can be implemented without significant costs to employers, require governmental agencies to maintain or attempt to modify the preferred travel desires of the majority of commuters, i.e. single-occupancy vehicles. The TDM emphasis areas include:

- Flex hours (begin and/or finish work outside of congested peak periods)
- Compressed work weeks (4 days/week or 9 days over two weeks)
- Telecommuting (work-at-home one day a week or more)

Any other programs that employers desire to implement will also receive the full support of NRPC in planning and execution.

AIR QUALITY CONFORMITY DETERMINATION

New Hampshire Ozone Status

For over 20 years, New Hampshire has been working to improve the quality of the air with the focus being to reduce the amount of ozone that forms during the summer months. The Nashua Regional Planning Commission in its role as the Metropolitan Planning Organization has partnered with NHDOT and the NH Department of Environmental Services (NHDES) to reduce mobile source emissions and meet the ozone standards set by the US Environmental Protection Agency (EPA). Over the last two decades, two ozone standards have been in effect in New Hampshire: the 1997 8-hour standard of 80 parts per billion (ppb) and the more stringent 2008 8-hour standard of 75 ppb.

Portions of southern New Hampshire did not meet the 1997 80 ppb standard, and what was defined as the "Boston-Manchester-Portsmouth (SE) NH area" was designated non-attainment. As required by the Clean Air Act (CAA), NRPC worked to identify transportation projects that would reduce congestion and support non-motorized mode of transportation. These efforts, combined with federal programs such as federal vehicle emission standards and fuel standards, were successful in reducing emissions in NH. By 2008, New Hampshire's ozone levels were below both the 1997 standard and the 2008 standard of 75 ppb.

In May 2012, EPA took three actions concerning New Hampshire's status under both ozone standards. First, EPA declared New Hampshire to be "unclassifiable/attainment" with respect to the 2008, 75 ppb standard. Second, EPA revoked the 1997 standard for transportation conformity purposes only. Third, EPA proposed approval of New Hampshire's redesignation request to attainment under the 1997 standard which became effective March 4, 2013.

On July 20, 2013, all of New Hampshire became unclassifiable/attainment for the 2008 8-Hour Ozone National Ambient Air Quality Standard (the 2008 ozone standard) and on April 6, 2015, the 1997 8-Hour Ozone National Ambient Air Quality Standard (the 1997 ozone standard) was revoked for all purposes, including transportation conformity, in the Boston-Manchester-Portsmouth (SE) NH area.

On February 16, 2018, the United States Court of Appeals for the District of Columbia Circuit in *South Coast Air Quality Mgmt. District v. EPA* ("South Coast II," 882 F.3d 1138) held that transportation conformity determinations must be made in areas that were either nonattainment or maintenance for the 1997 ozone national ambient air quality standard (NAAQS) and attainment for the 2008 ozone NAAQS when the 1997 ozone NAAQS was revoked. These conformity determinations are required in these areas after February 16, 2019. Therefore, per the *South Coast II decision*, this conformity determination is being made for the 1997 ozone NAAQS on the MTP and TIP.

This conformity determination was completed consistent with CAA requirements, existing associated regulations at 40 CFR Parts 51.390 and 93, and the *South Coast II decision*, according to EPA's *Transportation Conformity Guidance for the South Coast II Court Decision* issued on November 29, 2018.

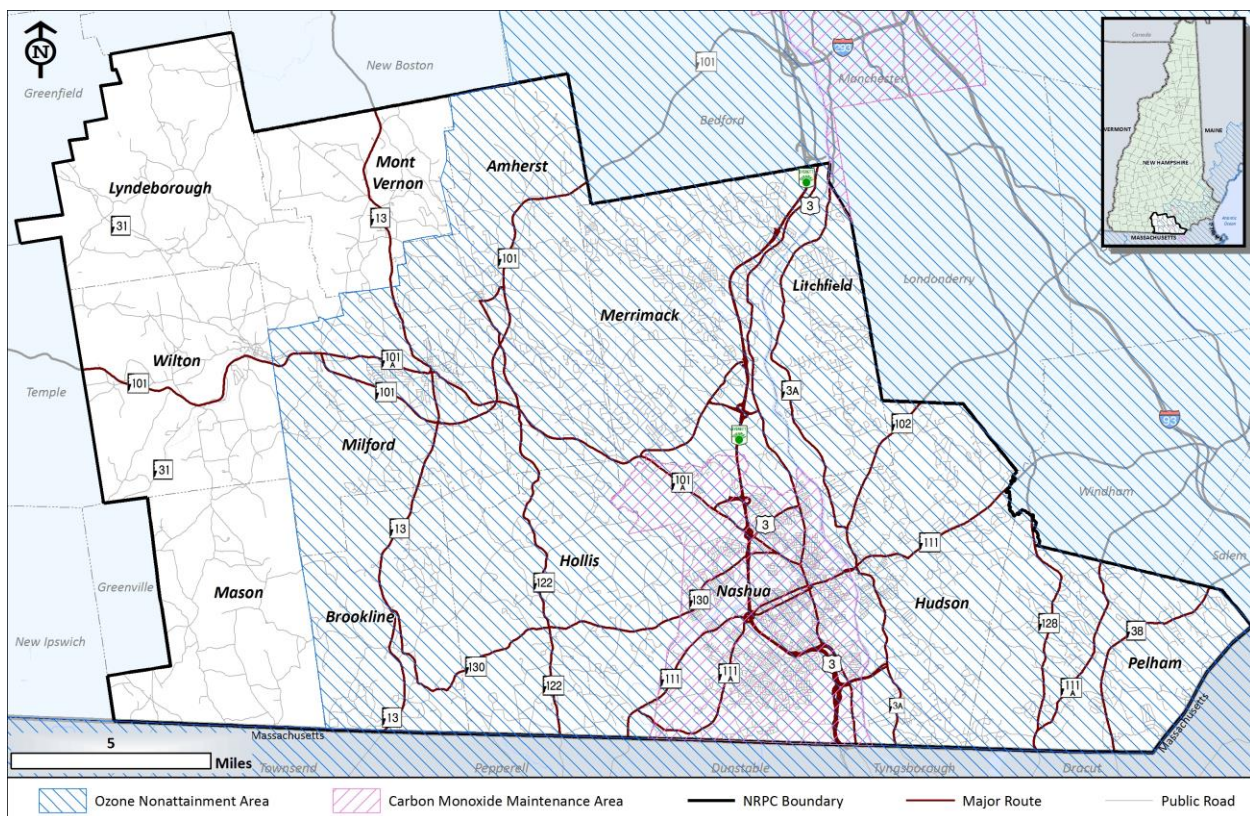
The concept of transportation conformity was introduced in the Clean Air Act (CAA) of 1977, which included a provision to ensure that transportation investments conform to a State implementation plan (SIP) for meeting the Federal air quality standards. Conformity requirements were made substantially more rigorous in the CAA Amendments of 1990. The transportation conformity regulations that detail

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implementation of the CAA requirements were first issued in November 1993, and have been amended several times. The regulations establish the criteria and procedures for transportation agencies to demonstrate that air pollutant emissions from metropolitan transportation plans, transportation improvement programs and projects are consistent with (“conform to”) the State’s air quality goals in the SIP. This document has been prepared for State and local officials who are involved in decision making on transportation investments.

Transportation conformity is required under CAA Section 176(c) to ensure that Federally-supported transportation activities are consistent with (“conform to”) the purpose of a State’s SIP. Transportation conformity establishes the framework for improving air quality to protect public health and the environment. Conformity to the purpose of the SIP means Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding and approvals are given to highway and transit activities that will not cause new air quality violations, worsen existing air quality violations, or delay timely attainment of the relevant air quality standard, or any interim milestone.

The 1997 ozone nonattainment area is shown below.



Transportation Conformity Requirements

Overview

On November 29, 2018, EPA issued **Transportation Conformity Guidance for the South Coast II Court Decision**⁹ (EPA-420-B-18-050, November 2018) that addresses how transportation conformity determinations can be made in areas that were nonattainment or maintenance for the 1997 ozone NAAQS when the 1997 ozone NAAQS was revoked, but were designated attainment for the 2008 ozone NAAQS in EPA's original designations for this NAAQS (May 21, 2012).

The transportation conformity regulation at 40 CFR 93.109 sets forth the criteria and procedures for determining conformity. The conformity criteria for MTPs and TIPs include: latest planning assumptions (93.110), latest emissions model (93.111), consultation (93.112), transportation control measures (93.113(b) and (c), and emissions budget and/or interim emissions (93.118 and/or 93.119).

For the 1997 ozone NAAQS areas, transportation conformity for MTPs and TIPs for the 1997 ozone NAAQS can be demonstrated without a regional emissions analysis, per 40 CFR 93.109(c). This provision states that the regional emissions analysis requirement applies one year after the effective date of EPA's nonattainment designation for a NAAQS and until the effective date of revocation of such NAAQS for an area. The 1997 ozone NAAQS revocation was effective on April 6, 2015, and the *South Coast II* court upheld the revocation. As no regional emission analysis is required for this conformity determination, there is no requirement to use the latest emissions model, or budget or interim emissions tests.

Therefore, transportation conformity for the 1997 ozone NAAQS for the Nashua MPO TIP can be demonstrated by showing the remaining requirements in Table 1 in 40 CFR 93.109 have been met. These requirements, which are laid out in Section 2.4 of EPA's guidance and addressed below, include:

- Latest planning assumptions (93.110)
- Consultation (93.112)
- Transportation Control Measures (93.113)
- Fiscal constraint (93.108)

The following is a summary of how these requirements have been addressed.

Latest Planning Assumptions

In 2018, for preparation of a full update of the Metropolitan Transportation Plan, NRPC undertook enhancements to its regional travel model. Free flow (uncongested) speed data were reviewed and adjusted where appropriate. Congested speed data were compared with INRIX data during peak periods. Two adjustments to the model were made to better represent congested conditions. A modified Bureau of Public Roads (BPR) curve which results in a new Alpha coefficient and two Beta (exponent of the power function) coefficients for non-expressway and expressway facilities. Lane capacities were also reviewed and modified as necessary to produce the desired congested speeds representing AM and PM peak period speeds. NRPC continues to monitor speed data through analysis of the National Performance Monitoring Research Data Set (NPMRDS) on a facility by facility basis. Findings

⁹ Available from <https://www.epa.gov/sites/production/files/2018-11/documents/420b18050.pdf>

will be used to continually update travel model inputs, as accurate speed data is an integral component to emissions analysis.

NRPC also conducted new forecasts of population and employment in 2018 as inputs to the travel model for future traffic forecasting using the following methodology:

a. Population - Through a combination of in-person interviews and other correspondence with local officials in most communities, NRPC compiled a list of known and potential areas of residential development through 2045. These new households were then added to the appropriate TAZ and current Census/ACS ratios were used to split the totals for various subcategories, such as:

- Household size
- Vehicles available
- Labor force
- Occupation

This data was measured against the results of NRPC's in-house population projections, which rely on a similar methodology to one once used by what is now the New Hampshire State Office of Strategic Initiatives. In cases where potential developments did not generate enough population to reach the projected totals, further households were added to TAZs where vacant and properly-zoned land was available, if possible. In cases where they generated more population than projected, NRPC did not include developments that were assumed as potential rather than known to be built. If known developments alone still surpassed projections, NRPC allowed them to be entered as model inputs.

For the rural towns with little assumed future growth, NRPC relied strictly on the population projects and manually adding new households to appropriate TAZs with buildable area.

b. Employment - New Hampshire Employment Security publishes industry-specific employment projections at the planning region level for 10 years out, with the latest available dataset projecting to 2024. To reach NRPC's horizon year of 2045, these projections were extended out using straight-line methodology and assumed to be proportionally distributed across all 13 communities. Methodology for assigning new employees to the TAZ level are similar to the above population projections, with known and assumed developments taking precedence and manual adjustments made up or down where possible to replicate the total projections.

Consultation

The Nashua MPO engages in several consultation processes relevant to air quality conformity. The Partnering for Performance in New Hampshire (PFPNH) monthly meetings bring together the four NH MPO's, the FHWA and NHDOT/NHDES (for relevant topics) to discuss coordinated approaches to planning tasks. These include development of Performance Measures, use and analysis of NPMRDS speed data for congestion analysis, Air Quality Conformity issues, UPWP coordination, etc.

The MPOs engage in one Interagency Consultation per month with NHDOT, NHDES, FHWA and FTA to coordinate planning efforts and methodologies, including those pertinent to the Air Quality Conformity process.

Beginning in 2018, the modeling staff from the MPOs began meeting on a periodic basis as a Model Users Group, to work toward model enhancements, comparison of model approaches and input data and work toward the potential development of an integrated Southern New Hampshire Travel Model. An integrated model would enable more accurate forecasting of project impacts across regions and hence more accurate modeling for air quality purposes, if required.

Transportation Control Measures

New Hampshire has one Transportation Control Measure (TCM) in place, a motor vehicle inspection/maintenance (I/M) program, which identifies vehicles that exceed for may exceed air pollution emission standards and requires such vehicles to be repaired. This program is an important part of the state's strategy to attain and maintain the National Ambient Air Quality Standard for ozone.

Section 182(c) of the federal Clean Air Act requires "enhanced" vehicle I/M programs in certain areas having a history of elevated concentrations of ground-level ozone, the chief component of smog. In addition, Section 184(b) of the CAA outlines I/M requirements for larger population centers of the member states of the Northeast Ozone Transport Region (OTR), which includes New Hampshire.

Based on monitored ozone values, portions of southern New Hampshire (all or parts of Hillsborough, Rockingham, Strafford and Merrimack counties) have qualified in the past for shared I/M.

New Hampshire meets its I/M obligations through an Enhanced Safety Inspection (ESI), which is implemented statewide. The ESI has the following mandatory features:

- Visual anti-tampering inspection of vehicles less than 20 years old;
- A statewide On-Board Diagnostics (OBD II) Inspection Program for light-duty vehicles (less than 8500 lbs. GVWR) less than 20 years old; and
- A Diesel Opacity Testing Program for heavy-duty vehicles (greater than 10,000 lbs. GVWR).

Fiscal Constraint

Transportation Conformity requirements in 40 CFR 93.108 state that transportation plans and TIPs must be fiscally constrained consistent with DOT's metropolitan planning regulations at 23 CFR part 450. The NRPC 2019-2045 Metropolitan Transportation Plan and 2019-2022 TIP are fiscally constrained. A comprehensive Financial Analysis is conducted in Chapter VI this TIP and in the MTP demonstrate fiscal constraint of both documents.

Nashua Carbon Monoxide Status

The City of Nashua was designated a non-attainment area for Carbon Monoxide (CO) in 1980 by the EPA. Unlike ozone, CO pollution is prevalent throughout the year and typically concentrated in urban areas with congested intersection and arterial roadways. NRPC has worked with the City of Nashua, NHDOT and NHDES to reduce mobile source emissions and meet the CO standards set by EPA. Over the last two plus decades, the intersection improvements, increased transit service and other transportation demand strategies have worked in conjunction with reduced tail pipe emissions to decrease the number of exceedances of the CO standard. By 2001 EPA designated Nashua "in attainment" with a Maintenance Plan requiring continued monitoring and air quality analyses to ensure the CO standard

was not violated by proposed projects. On March 10, 2014, EPA approved a Limited Maintenance Plan for the City of Nashua, relinquishing the NRPC of additional air quality analyses for projects proposed in the TIP and MTP.

Projects which are exempt from analysis in the Air Quality Conformity Determination are assigned specific Clean Air Act Codes. These include construction projects that do not involve capacity expansion or new facilities. New highway projects or capacity expansion of existing highways are considered non-exempt and their impacts are evaluated.

Clean Air Act Status/Codes for projects included in the MTP

Safety

- E-1 Railroad/highway crossing
- E-2 Hazard elimination program
- E-6 Safety improvement program
- E-7 Traffic control devices and operating assistance other than signalization projects
- E-9 Guardrails, median barriers, crash cushions
- E-10 Pavement resurfacing and/or rehabilitation
- E-11 Pavement marking demonstration
- E-19 Widening narrow pavements or reconstructing bridges (no additional travel lanes)

Mass Transit

- E-21 Operating assistance to transit agencies
- E-24 Purchase of office, shop and operating equipment for existing facilities
- E-28 Reconstruction or renovation of transit buildings and structures
- E-30 Purchase of new buses and new rail cars to replace existing vehicles or for minor expansions of the fleet
- E-31 Construction of new bus or rail storage/maintenance facilities

Air Quality

- E-33 Bicycle and pedestrian facilities

Other

- E-34 Planning and technical studies
- E-35 Grants for training and research programs
- E-38 Engineering to assess social, economic and environmental effects of the proposed action or alternatives to that action
- E-44 Directional and informational signs
- ALL Statewide or Programmatic project and, therefore, not subject to conformity
- ATT Project is located in attainment area and, therefore, not subject to conformity

Projects Exempt from Regional Emissions Analysis

- E-51 Intersection channelization projects

Not Exempt Code

- N/E Project is not exempt

ENVIRONMENTAL CONCERNS OF PROJECTS & MITIGATION STRATEGIES

Eight environmental resource areas were identified in order to discuss the range of potential environmental issues that may be associated with projects in the Nashua Metropolitan Area TIP. In general, the issues described may be either short-term or long-term, resulting from both temporary construction disturbance activities and long-term utilization of the proposed transportation venue. Impacts to each of the environmental resources may also be either direct or indirect. Direct impacts may result from immediate impacts to the specific resource in question, such as with the immediate filling of a wetland to provide a suitable roadbed, or the noise associated with vehicular traffic along a roadway. Indirect impacts are associated with a project but tend to occur in either a temporally or spatially separate manner, such as the delayed impacts of stormwater runoff to a waterway, or the out-migration of a songbird due to increased human activity adjacent to the new roadway.

Four projects were identified as having associated environmental effects that are worthy of discussing in detail: NH 101A Widening, NH 101 Improvements, Hudson Boulevard and FEE Turnpike widening. A number of projects were excluded from this table: those projects that had no associated new ground disturbing activities or those that involved only widening of thruway already within a disturbed corridor were excluded. Planning projects, signalization and signing projects, and those that involved restoration of previously existing services were also excluded. Bridge replacement projects and bridge enhancement projects were also excluded, due to the limited short-term nature of the expected environmental effects, have the potential for temporary impacts to wetlands and riparian habitats that involve no or minimal ground-disturbing activities. Environmental impacts of the five identified projects are discussed in the table below.

It should also be noted that the National Environmental Policy Act requires a detailed assessment of environmental impacts for all federally funded projects. The following is a preliminary analysis to guide transportation planning. Therefore, the environmental effects and mitigation measures provided below give a broad interpretation for the range of issues which may be analyzed in greater detail during project development. Only Ten Year Plan and MPO recommended future projects are evaluated. Illustrative projects are not evaluated, as they are not included in the official list of recommended projects.

NH 101A Widening, Nashua-Merrimack

- Air Quality – Short term emissions from construction vehicles and construction dust are likely to be insignificant. Long-term impacts may include the potential reduction of ambient air quality in already-impacted air sheds. Implementation of dust-abatement programs on as-needed basis during construction.
- Archeological/Cultural Resources – No impacts.
- Prime Farmland – No impacts.
- Species of Special Concern – No impacts.
- Wetlands – Roadway construction may impact wetlands. Indirect impacts may occur from increased stormwater flows and pollutant loading. Wetland surveys and proposed mitigation may be implemented prior to construction in order to minimize construction disturbance in

wetland habitats. NHDOT has incorporated stormwater management into the project scope, entailing bioretention systems

- Riparian Habitats – No impacts.
- Noise – Impacts from construction noise may occur during construction phases close to residential areas. Long-term noise impacts are likely to be below thresholds requiring specific mitigation.
- Floodplains – Direct impacts to floodplains are likely to be insignificant. Indirect impacts may be associated with increased imperviousness and fill associated with adjacent developments.

NH 101 Improvements, Wilton to Bedford

- Air Quality – Short term emissions from construction vehicles and construction dust are likely to be insignificant. Long-term impacts may include the potential reduction of ambient air quality in already-impacted air sheds. Implementation of dust-abatement programs on as-needed basis during construction.
- Archeological/Cultural Resources – No impacts.
- Prime Farmland – No impacts.
- Species of Special Concern – Impacts to species of special concern could result from direct impacts o construction and indirect impacts due to habitat loss, habitat degradation or impacts to migratory corridors. Threatened and Endangered species surveys may be required prior to construction. Mitigation for habitat loss and/or degradation may be required, depending upon the ultimate scope of the project.
- Wetlands – There are significant wetlands along the NH 101 corridor in Amherst and Milford. Safety improvements should minimally impact these areas; a widening program (Illustrative in this MTP) would necessitate mitigation measures.
- Riparian Habitats – Roadway construction may impact riparian habitats. Indirect impacts from increased stormwater flows, pollutant loading and bank destabilization may also affect riparian resources, depending on the ultimate scope of the project.
- Noise – Impacts from construction noise may occur during construction phases close to residential areas. Long-term noise impacts are likely to be below thresholds requiring specific mitigation.
- Floodplains – Direct impacts to floodplains are likely to be insignificant. Indirect impacts may be associated with increased imperviousness and fill associated with adjacent developments.

Hudson Boulevard, Hudson

- Air Quality – Short term emissions from construction vehicles and construction dust are likely to be insignificant. Long-term impacts may include the potential reduction of ambient air quality in already-impacted air sheds. Implementation of dust-abatement programs on as-needed basis during construction.
- Archeological/Cultural Resources – The project alignment is in close proximity to two properties of cultural importance in Hudson and eligible for nomination for the National Register of Historic Places. These are the Fred Giddings House and Asa Davis House. The 1993 Final EIS identified 39

prehistoric archeological sites along the full Circumferential Highway corridor, although specific site locations are not disclosed in the FEIS for their protection.

- Prime Farmland – There is at least one area of Prime Farmland likely to be impacted by the project, located about 0.8 mile east of the Merrimack River in Hudson. The specific alignment to be chosen should attempt to minimize these areas.
- Species of Special Concern –
- Wetlands – The project may impact the Upper Limit Brook 44-acre wetland complex in southern Hudson. Although relatively small in area, the site contains a great diversity of wetland classes and vegetative life forms. It may also come in close proximity to the Second Brook System. This watershed encompasses more than 3,330 acres and includes the largest "less disturbed" expanse of land in Hudson. The final alignment of the roadway should attempt to minimize impacts to both of these areas.
- Riparian Habitats – The Upper Limit Brook and Second Brook System areas are important riparian habitats, which reinforces the need for the selected alignment to avoid impacting these areas.
- Noise — Impacts from construction noise may occur during construction phases close to residential areas. Long-term noise impacts are likely to be below thresholds requiring specific mitigation.
- Floodplains – The alignment may come in close proximity to, or be tangential to the 100-year flood boundary in the Second Brook area. Mitigation in construction through elevation in this area may be necessary.

FEE Turnpike Widening, Nashua – Merrimack

- Air Quality – Air quality modeling indicated that carbon monoxide concentrations, PM10, PM2.5 were all well below the established thresholds for the worst-case scenario. MSAT and greenhouse gases are estimated to be lower than the No-Build Alternative in future years. It is concluded that the project would not cause or contribute to exceedances of the NAAQS.
- Archeological/Cultural Resources – Phase 1B and Phase 2 testing were conducted on five identified sites by archeologists. Only one site, the Naticook Brook 1 site, was deemed potentially eligible for listing on the National Register.
- Prime Farmland – No impacts. Construction will be within an existing ROW purchased before 8/4/84, hence not subject to FPPA provisions.
- Species of Special Concern – The Environmental Study identified several Threatened and Endangered Wildlife Species and identified control measures that will ensure no adverse impacts, including soil erosion and sediment control practices.
- Wetlands – A number of wetland project locations are identified in the project Environmental Study. The City of Nashua has designated prime wetland in the study area along Pennichuck Brook and has waived the 100-foot buffer for this area. NHDOT will prepare a proposed mitigation packed through coordination with regulatory agencies and other interested parties to avoid direct impacts to wetlands and waterways.

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- Riparian Habitats – Both the Pennnichuck and Baboosic Brook crossings will be constructed by NHDOT to incorporate wildlife shelves into the design to facilitate wildlife passage. NHDOT has committed to minimizing and avoiding impacts to vernal pools and other wetland habitat areas.
- Noise – Noise impacts of the project have been evaluated by NHDOT and noise barrier locations have been determined, in consultation with neighborhood interests in close proximity to the highway.
- Floodplains – The project lies within the mapped 100-year floodplain and regulatory floodway of several streams and one impoundment. Floodwater modeling has indicated that the Baboosic Brook crossing is overtopped by the 100-year flood event, although there have been no recorded instances of that occurring. NHDOT has provided for elevation of the crossing in its design to mitigate this potential event. During final design mitigation of impacts at Pennnichuck Brook and Patten Brook will be explored.

FINANCIAL ANALYSIS

FISCAL CONSTRAINT

Federal regulations require that the MTP "shall include a financial plan that demonstrates how the adopted transportation plan can be implemented." Requirements include: estimates of costs and revenue sources "that are reasonably expected to be available to adequately operate and maintain Federal-aid highways and public transportation; estimates of available funds from all necessary financial resources; recommendations for additional strategies to support the availability of any new sources; all projects and strategies proposed for funding under title 23 U.S.C, title 49 U.S.C. Chapter 53 or with other Federal funds; State assistance; local sources and private participation; use of "year of expenditure dollars" for estimating revenue and costs in future years; specific financial strategies required to ensure the implementation of Transportation Control Measures in air quality nonattainment and maintenance areas, and "for illustrative purposes, the financial plan may – but is not required to – include additional projects that would be included in the adopted transportation plan if additional resources beyond those identified in the financial plan were to become available."

For statewide FHWA resources, the programmed figures for FY 2019 to FY 2028 from the State's TYP are utilized for the fiscal constraint analysis, as the NHDOT has determined the FHWA resources that will be available to the state for this period. Their figures show a range from \$181.9 million in 2019 to \$185.5 million in 2028 in total apportionment. As there is no distinct trend over this period, we assume the \$185.5 is carried through to 2045. This is a conservative assumption, as it would be expected there would be some level of increase in federal funds over the long term.

Each region receives a "theoretical allocation" of the statewide FHWA resources that is based on the percentage of statewide population in the region and the percentage of federal aid road miles. There is a 50/50 weight applied to each. The NRPC region contains 15.8% of the state's population and 9.0% of the federal aid road mileage. This results in an allocation of 12.35% of federal funds to the NRPC region, which translates to \$22.9 million per year in federal funds.

The allocation amount does not represent the amount that is available for new projects. A substantial portion of the region's theoretical share goes toward statewide or programmatic projects, which include highway paving/reconstruction, bridge rehab and reconstruction, safety improvements, signage, etc. The regional share of the statewide total is subtracted from the theoretical allocation to provide a balance remaining for new projects.

The fiscal constraint table produced for this MTP indicates that the cost MPO projects and the MPO share of statewide projects is less than the theoretical allocation for the 2019-2022 TIP period by \$19.4 million. For the MTP time frame through 2045 a balance of \$182.1 million is projected, which will fund future regional TYP project submissions through 2045.

Beyond 2022, the final year of the TIP, statewide project costs are inflated by 2.55% annually. NRPC MPO projects have already been inflated in the project estimates.

**2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects**

FISCAL CONSTRAINT ANALYSIS FOR NASHUA MTP RECOMMENDED PROJECTS

Fiscal Year	Statewide FHWA \$	NRPC MPA Share (12.35%) (1)	NRPC MPO Projects	NRPC Share Statewide Proj	Total NRPC MPO Projects	FY Balance	Cumulative Balance
2019 - 2022 TRANSPORTATION IMPROVEMENT PROGRAM							
2019	\$181,209,912	\$22,379,424	\$5,003,982	\$9,218,318	\$14,222,301	\$8,157,124	\$8,157,124
2020	\$185,489,629	\$22,907,969	\$7,499,410	\$8,854,839	\$16,354,249	\$6,553,720	\$14,710,844
2021	\$185,489,629	\$22,907,969	\$11,875,463	\$9,883,736	\$21,759,198	\$1,148,771	\$15,859,615
2022	\$185,489,629	\$22,907,969	\$9,582,586	\$9,757,777	\$19,340,363	\$3,567,606	\$19,427,221
2019 - 2028 TEN-YEAR PLAN							
2023	\$185,489,629	\$22,907,969	\$288,193	\$10,006,600	\$10,294,793	\$12,613,176	\$32,040,397
2024	\$185,489,629	\$22,907,969	\$5,838,639	\$10,261,768	\$16,100,407	\$6,807,562	\$38,847,959
2025	\$185,489,629	\$22,907,969	\$8,225,436	\$10,523,444	\$18,748,879	\$4,159,090	\$43,007,049
2026	\$185,489,629	\$22,907,969	\$7,106,284	\$10,791,791	\$17,898,075	\$5,009,894	\$48,016,943
2027	\$185,489,629	\$22,907,969	\$865,406	\$11,066,982	\$11,932,388	\$10,975,582	\$58,992,525
2028	\$185,489,629	\$22,907,969	\$1,965,376	\$11,349,190	\$13,314,566	\$9,593,403	\$68,585,928
2029 - 2045 METROPOLITAN TRANSPORTATION PLAN							
2029	\$185,489,629	\$22,907,969	\$5,237,705	\$11,638,594	\$16,876,300	\$6,031,669	\$74,617,597
2030	\$185,489,629	\$22,907,969	\$4,785,821	\$11,935,379	\$16,721,200	\$6,186,769	\$80,804,366
2031	\$185,489,629	\$22,907,969	\$4,474,018	\$12,239,731	\$16,713,748	\$6,194,221	\$86,998,587
2032	\$185,489,629	\$22,907,969	\$2,926,179	\$12,551,844	\$15,478,023	\$7,429,947	\$94,428,534
2033	\$185,489,629	\$22,907,969	\$228,320	\$12,871,916	\$13,100,236	\$9,807,733	\$104,236,267
2034	\$185,489,629	\$22,907,969	\$1,535,056	\$13,200,150	\$14,735,206	\$8,172,763	\$112,409,030
2035	\$185,489,629	\$22,907,969	\$1,005,304	\$13,536,754	\$14,542,057	\$8,365,912	\$120,774,942
2036	\$185,489,629	\$22,907,969	\$7,475,009	\$13,881,941	\$21,356,949	\$1,551,020	\$122,325,962
2037	\$185,489,629	\$22,907,969	\$576,763	\$14,235,930	\$14,812,693	\$8,095,276	\$130,421,238
2038	\$185,489,629	\$22,907,969	\$3,481,267	\$14,598,947	\$18,080,214	\$4,827,755	\$135,248,993
2039	\$185,489,629	\$22,907,969	\$50,457	\$14,971,220	\$15,021,676	\$7,886,293	\$143,135,286
2040	\$185,489,629	\$22,907,969	\$293,210	\$15,352,986	\$15,646,195	\$7,261,774	\$150,397,060
2041	\$185,489,629	\$22,907,969	\$0	\$15,744,487	\$15,744,487	\$7,163,482	\$157,560,542
2042	\$185,489,629	\$22,907,969	\$0	\$16,145,971	\$16,145,971	\$6,761,998	\$164,322,540
2043	\$185,489,629	\$22,907,969	\$0	\$16,557,694	\$16,557,694	\$6,350,276	\$170,672,816
2044	\$185,489,629	\$22,907,969	\$0	\$16,979,915	\$16,979,915	\$5,928,054	\$176,600,870
2045	\$185,489,629	\$22,907,969	\$0	\$17,412,903	\$17,412,903	\$5,495,067	\$182,095,937
\$5,003,940,266		\$617,986,623	\$90,319,881	\$345,570,805	\$435,890,686	\$182,095,937	

(1) Share based on the percentage of statewide population and lane miles of federal aid eligible roads in the NRPC MPA
2010 Census Population - NH 1,306,432 NRPC Area 205,765 = 15.8%
Federal Aid Eligible Road Mileage - NH 8,477 NRPC Area 759 = 9.0% Ave Pop & Mi. = 12.35%

OPERATIONS & MAINTENANCE REQUIREMENTS

Fiscal constraint requirements necessitate that the estimated costs of preserving, maintaining and operating the region's transportation system be included in the TIP and Metropolitan Transportation Plan. While some of these funds are captured in the "Statewide" projects included in the TIP, there are many that are not as they are implemented using state or local funds.

NHDOT's Fiscal Year 2020-2021 biennial budget provides information regarding the funding available at the state level for the operation and maintenance of the transportation system. These funds come from the sources shown in Table 11. The NRPC's share of the statewide total is calculated at 9.0%, based on the region's percentage of statewide federal-aid lane miles.

- **Highway Fund** – This is the primary source of funding for the NHDOT Operating budget and includes the NH Road Toll (gas tax), vehicle registration fees and court fines for traffic violations. About 58% of gas tax revenues go to operating costs for NHDOT and NH Department of Safety.
- **Turnpike Funds** – Funds from tolls, fines and administrative fees generated by the 90-mile turnpike system can only be used for turnpike facilities. The system raises about \$130 million per year of which approximately \$49 million is dedicated towards operations and maintenance.
- **General Funds** – There are a small amount of State of New Hampshire general funds that are used for operation and maintenance of the transportation system. Primarily these funds are used for airport operations.
- **Federal Funds** – NHDOT receives revenues from various federal agencies on a reimbursable basis to carry out federal aid eligible infrastructure improvements and construction projects. Most of these funds are from FHWA, with FTA, the Federal Aviation Administration and Federal Emergency Management Administration being other sources. Approximately \$32 million in federal funds was utilized in FY 2018 to balance the operating budget instead of being used for construction programs.
- **Other Funds** – Minor sources of funds include the sale of fuel to municipalities, railroad licensing fees, permitting fees, emergency repair funds and sale of surplus land.

Beyond the final year of the TIP, costs are increased by a 2.55% annual inflation rate.

**2019 – 2045 Metropolitan Transportation Plan
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FEDERAL & STATE RESOURCES FOR NASHUA MPA OPERATIONS & MAINTENANCE NEEDS

	Fiscal Year	Highway Fund	Federal Aid	Turnpike	General Fund & Other	Total Statewide	NRPC MPO Share
2019-2022 TIP	2019	\$175,400,000	\$49,900,000	\$46,900,000	\$20,900,000	\$293,100,000	\$26,379,000
	2020	\$174,100,000	\$40,200,000	\$47,900,000	\$20,300,000	\$282,500,000	\$25,425,000
	2021	\$178,700,000	\$51,400,000	\$47,800,000	\$20,400,000	\$298,300,000	\$26,847,000
	2022	\$179,400,000	\$48,700,000	\$48,400,000	\$20,000,000	\$296,500,000	\$26,685,000
2019-2028 TYP	2023	\$183,974,700	\$49,941,850	\$49,634,200	\$20,510,000	\$304,060,750	\$27,365,468
	2024	\$188,666,055	\$51,215,367	\$50,899,872	\$21,033,005	\$311,814,299	\$28,063,287
	2025	\$193,477,039	\$52,521,359	\$52,197,819	\$21,569,347	\$319,765,564	\$28,778,901
	2026	\$198,410,704	\$53,860,654	\$53,528,863	\$22,119,365	\$327,919,586	\$29,512,763
	2027	\$203,470,177	\$55,234,100	\$54,893,849	\$22,683,409	\$336,281,535	\$30,265,338
	2028	\$208,658,666	\$56,642,570	\$56,293,642	\$23,261,836	\$344,856,714	\$31,037,104
2029-2045 MTP	2029	\$213,979,462	\$58,086,955	\$57,729,130	\$23,855,013	\$353,650,560	\$31,828,550
	2030	\$219,435,938	\$59,568,173	\$59,201,223	\$24,463,315	\$362,668,650	\$32,640,178
	2031	\$225,031,555	\$61,087,161	\$60,710,854	\$25,087,130	\$371,916,700	\$33,472,503
	2032	\$230,769,860	\$62,644,884	\$62,258,981	\$25,726,852	\$381,400,576	\$34,326,052
	2033	\$236,654,491	\$64,242,328	\$63,846,585	\$26,382,886	\$391,126,291	\$35,201,366
	2034	\$242,689,180	\$65,880,508	\$65,474,673	\$27,055,650	\$401,100,011	\$36,099,001
	2035	\$248,877,755	\$67,560,461	\$67,144,277	\$27,745,569	\$411,328,062	\$37,019,526
	2036	\$255,224,137	\$69,283,252	\$68,856,456	\$28,453,081	\$421,816,927	\$37,963,523
	2037	\$261,732,353	\$71,049,975	\$70,612,296	\$29,178,635	\$432,573,259	\$38,931,593
	2038	\$268,406,528	\$72,861,750	\$72,412,909	\$29,922,690	\$443,603,877	\$39,924,349
	2039	\$275,250,894	\$74,719,724	\$74,259,439	\$30,685,718	\$454,915,776	\$40,942,420
	2040	\$282,269,792	\$76,625,077	\$76,153,054	\$31,468,204	\$466,516,128	\$41,986,452
	2041	\$289,467,672	\$78,579,017	\$78,094,957	\$32,270,643	\$478,412,289	\$43,057,106
	2042	\$296,849,097	\$80,582,782	\$80,086,379	\$33,093,545	\$490,611,803	\$44,155,062
	2043	\$304,418,749	\$82,637,643	\$82,128,581	\$33,937,430	\$503,122,404	\$45,281,016
	2044	\$312,181,428	\$84,744,903	\$84,222,860	\$34,802,835	\$515,952,025	\$46,435,682
	2045	\$320,142,054	\$86,905,898	\$86,370,543	\$35,690,307	\$529,108,802	\$47,619,792
		\$6,367,638,286	\$1,726,676,391	\$1,718,011,444	\$712,596,464	\$10,524,922,586	\$947,243,033

METROPOLITAN TRANSPORTATION PLAN
PROJECT LISTING 2019 – 2045
TEN YEAR PLAN PROJECTS
NASHUA MPO RECOMMENDED 2029 – 2045 PROJECTS
NASHUA MPO ILLUSTRATIVE PROJECTS

**2019 – 2045 Metropolitan Transportation Plan
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AMHERST	Horace Greeley Rd						Project ID:	20231
Scope:	Bridge Replacement over Pulpit Brook (Bridge ID 060/158)						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		
PE	2019	\$0	\$131,482	\$32,870	\$164,352	SAB, Town		
ROW	2019	\$0	\$800	\$200	\$1,000	SAB, Town		
CON	2019	\$0	\$502,823	\$125,706	\$628,529	SAB, Town		
CON	2020	\$0	\$502,823	\$125,706	\$628,529	SAB, Town		
	MTP Total:	\$0	\$1,137,928	\$284,482	\$1,422,410			
AMHERST	Mont Vernon Rd over Caesars Brook						Project ID:	40654
Scope:	Bridge Replacement - Mont Vernon Rd over Caesars Brook #122/071						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		
PE	2022	\$0	\$97,326	\$24,331	\$121,657	SAB, Town		
ROW	2022	\$0	\$4,424	\$1,106	\$5,530	SAB, Town		
CON	2022	\$0	\$707,820	\$176,955	\$884,775	SAB, Town		
	MTP Total:	\$0	\$809,570	\$202,392	\$1,011,962			
AMHERST	Thornton Ferry Rd. over Beaver Brook						Project ID:	40657
Scope:	Bridge Replacement - Thornton Ferry Rd over Beaver Brook #145/106 {State Aid Bridge Program}						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		
PE	2023	\$0	\$226,834	\$56,709	\$283,543	SAB, Town		
ROW	2023	\$0	\$4,537	\$1,134	\$5,671	SAB, Town		
CON	2023	\$0	\$1,265,734	\$316,434	\$1,582,168	SAB, Town		
	MTP Total:	\$0	\$1,497,106	\$374,276	\$1,871,382			
AMHERST	NH 122						Project ID:	41413
Scope:	Bridge Deck Replacement over NH Route 101 (Bridge ID 135/109)						Managed By:	NHDOT
							Regionally Sig.:	No
							CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		
PE	2021	\$237,263	\$0.0	\$0	\$237,263	STP-State Flex, Toll Credit		
PE	2023	\$249,517	\$0.0	\$0	\$249,517	STP-State Flex, Toll Credit		
CON	2024	\$2,558,802	\$0.0	\$0	\$2,558,802	STP-State Flex, Toll Credit		
	MTP Total:	\$3,045,582	\$0	\$0	\$3,045,582			
BROOKLINE	NH 13						Project ID:	40662
Scope:	Construct southbound left turn lane onto Old Milford Rd						Managed By:	NHDOT
							Regionally Sig.:	No
							CAA Status:	E-51
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		
PE	2020	\$11,568	\$0	\$0	\$11,568	STP-State Flex, Toll Credit		
PE	2021	\$11,863	\$0	\$0	\$11,863	STP-State Flex, Toll Credit		
ROW	2023	\$12,476	\$0	\$0	\$12,476	STP-State Flex, Toll Credit		
CON	2026	\$228,732	\$0	\$0	\$228,732	STP-State Flex, Toll Credit		
	MTP Total:	\$264,639	\$0	\$0	\$264,639			

**2019 – 2045 Metropolitan Transportation Plan
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BROOKLINE	South Main St, Mason Rd.					Project ID:	41364
Scope:	Construct sidewalks on Rte 130, pedestrian bridge over Nissitissit River & sidewalk to beach					Managed By:	NHDOT
						Regionally Sig.:	No
						CAA Status:	E-33
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>	
PE	2019	\$14,400	\$0	\$3,600	\$18,000	TAP, Town	
ROW	2019	\$8,000	\$0	\$2,000	\$10,000	TAP, Town	
CON	2019	\$508,000	\$0	\$127,000	\$635,000	TAP, Town	
	MTP Total:	\$530,400	\$0	\$132,600	\$663,000		
BROOKLINE	Bond Street over Nissitissit River					Project ID:	41408
Scope:	Bridge Rehabilitation, Bond St. over Nissitissit River					Managed By:	NHDOT
						Regionally Sig.:	No
						CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>	
PE	2024	\$0	\$88,477	\$22,119	\$110,596	SB367-4-Cents, Town	
ROW	2024	\$0	\$4,424	\$1,106	\$5,530	SB367-4-Cents, Town	
CON	2024	\$0	\$152,624	\$38,156	\$190,780	SB367-4-Cents, Town	
CON	2025	\$0	\$251,786	\$62,946	\$314,732	SB367-4-Cents, Town	
	MTP Total:	\$0	\$497,311	\$124,327	\$621,638		
HUDSON	NH 3A					Project ID:	41754
Scope:	Construct a third southbound right turn lane on NH 3A Lowell Rd.					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	E-51
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>	
PE	2019	\$72,000	\$0	\$18,000	\$90,000	CMAQ, Town	
PE	2020	\$49,224	\$0	\$12,306	\$61,530	CMAQ, Town	
CON	2021	\$1,135,782	\$0	\$283,946	\$1,419,728	CMAQ, Town	
	MTP Total:	\$1,257,006	\$0	\$314,252	\$1,571,258		
HUDSON	Hudson Boulevard					Project ID:	42108
Scope:	Construct a two-lane controlled access roadway between NH 3A and NH 111 to be funded through local and private sources					Managed By:	NHDOT
						Regionally Sig.:	Yes
						CAA Status:	N/E
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>	
PE	2019	\$0	\$0	\$1,000,000	\$1,000,000	Town	
PE	2020	\$0	\$0	\$1,000,000	\$1,000,000	Town	
CON	2023	\$0	\$0	\$50,000,000	\$50,000,000	Town	
	MTP Total:	\$0	\$0	\$52,000,000	\$52,000,000		
LYNDEBOROUGH	NH Railroad					Project ID:	41435
Scope:	Address Red List Bridge carrying NHRR over Glass Factory Rd. (108/070)					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	Attainment
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>	
PE	2026	\$107,638	\$0	\$26,910	\$134,548	Bridge-T3-4-Rehab-Rcn,Town	
PE	2027	\$110,383	\$0	\$27,596	\$137,979	Bridge-T3-4-Rehab-Rcn,Town	
CON	2028	\$1,131,982	\$0	\$282,995	\$1,414,977	Bridge-T3-4-Rehab-Rcn,Town	
	MTP Total:	\$1,350,003	\$0	\$337,501	\$1,687,504		

**2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects**

MERRIMACK-BEDFORD	F.E. Everett Turnpike							Project ID:	16100
Scope:	Improvement to Bedford Mainline Toll Plaza to Institute Open Road Tolling or All Electronic Tolling							Managed By:	NHDOT
								Regionally Sig.:	Yes
								CAA Status:	E-7
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>			
CON	2020	\$0	\$11,100,000	\$0	\$11,100,000	Turnpike Capital			
CON	2021	\$0	\$4,100,000	\$0	\$4,100,000	Turnpike Capital			
OTHER	2019	\$0	\$100,000	\$0	\$100,000	Turnpike Capital			
	MTP Total:	\$0	\$15,300,000	\$0	\$15,300,000				
MERRIMACK	NH 101A							Project ID:	10136D
Scope:	Construct 3rd EB lane from Boston Post Rd to Continental Blvd & implement traffic calming at Craftsman Ln & Boston Post Rd							Managed By:	NHDOT
								Regionally Sig.:	No
								CAA Status:	N/E
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>			
PE	2019	\$770,000	\$0	\$0	\$770,000	STP-State Flexible, Toll Cr			
ROW	2019	\$1,045,000	\$0	\$0	\$1,045,000	STP-State Flexible, Toll Cr			
CON	2021	\$2,058,691	\$0	\$0	\$2,058,691	STP-State Flexible, Toll Cr			
CON	2022	\$2,631,755	\$0	\$0	\$2,631,755	STP-5 to 200k, Toll Cr			
	MTP Total:	\$6,505,446	\$0	\$0	\$6,505,446				
MERRIMACK	US 3							Project ID:	29174
Scope:	Bridge Replacement - US 3 over Baboosic Brook - Br. 118/135							Managed By:	Muni/Local
								Regionally Sig.:	No
								CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>			
PE	2023	\$0	\$172,394	\$43,098	\$215,492	SB367-4-Cents, Towns			
ROW	2023	\$0	\$9,073	\$2,268	\$11,342	SB367-4-Cents, Towns			
CON	2023	\$0	\$2,830,889	\$707,722	\$3,538,612	SB367-4-Cents, Towns			
	MTP Total:	\$0	\$3,012,357	\$753,089	\$3,765,446				
MERRIMACK	Bedford Rd.							Project ID:	15841
Scope:	Bridge Replacement - Bedford Rd. over Baboosic Brook - Br. 113/159							Managed By:	Muni/Local
								Regionally Sig.:	No
								CAA Status:	E-19
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>			
PE	2019	\$0	\$381,421	\$95,355	\$476,776	SB367-4-Cents, Town			
ROW	2019	\$0	\$4,000	\$1,000	\$5,000	SB367-4-Cents, Town			
CON	2019	\$0	\$1,482,494	\$370,623	\$1,853,117	SB367-4-Cents, Town			
CON	2021	\$0	\$1,804,696	\$451,174	\$2,255,870	SB367-4-Cents, Town			
	MTP Total:	\$0	\$3,672,611	\$918,153	\$4,590,763				
MERRIMACK	Multi-Use Path							Project ID:	40300
Scope:	Construct approximately 2,500 feet of multi-use trail connecting parks, schools and the downtown business district with an existing trail/sidewalk system.							Managed By:	Muni/Local
								Regionally Sig.:	No
								CAA Status:	E-33
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>			
PE	2019	\$33,313	\$0	\$8,328	\$41,641	TAP, Town			
CON	2019	\$719,085	\$0	\$179,771	\$898,856	TAP, Town			
	MTP Total:	\$752,398	\$0	\$188,099	\$940,497				

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MERRIMACK	Daniel Webster Highway					Project ID:	41588
Scope:	DW Highway/Wire Road - Intersection Improvement					Managed By:	NHDOT
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.: No
PE	2027	\$77,268	\$0	\$19,317	\$96,585	STP, Town	CAA Status: E-53
ROW	2027	\$11,038	\$0	\$2,760	\$13,798	STP, Town	
CON	2028	\$833,394	\$0	\$208,349	\$1,041,743	STP, Town	
	MTP Total:	\$921,701	\$0	\$230,425	\$1,152,126		
MERRIMACK	US 3					Project ID:	41830
Scope:	Construct new gasoline and diesel UST system					Managed By:	NHDOT
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.: No
CON	2019	\$0	\$550,000	\$0	\$550,000	NH Hwy Fund	CAA Status: E-24
	MTP Total:	\$0	\$550,000	\$0	\$550,000		
MERRIMACK-NASHUA- CONCORD	F.E. Everett Turnpike & US 3					Project ID:	41485
Scope:	Rehabilitation of Turnpike pavements					Managed By:	NHDOT
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.: No
PE	2019	\$0	\$15,000	\$0	\$15,000	Turnpike Renewal	CAA Status: E-10
CON	2019	\$0	\$250,000	\$0	\$250,000	Turnpike Renewal	
CON	2020	\$0	\$3,507,210	\$0	\$3,507,210	Turnpike Renewal	
	MTP Total:	\$0	\$3,772,210	\$0	\$3,772,210		
MILFORD	Bridge St.					Project ID:	41587
Scope:	Rehabilitation of the Swing Bridge					Managed By:	Muni/Local
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.: No
PE	2020	\$60,500	\$0	\$0	\$60,500	STP-5 to 200K, Toll Credit	CAA Status: E-19
PE	2024	\$121,657	\$0	\$0	\$121,657	STP-5 to 200K, Toll Credit	
ROW	2025	\$6,238	\$0	\$0	\$6,238	STP-5 to 200K, Toll Credit	
CON	2025	\$748,552	\$0	\$0	\$748,552	STP-5 to 200K, Toll Credit	
	MTP Total:	\$936,947	\$0	\$0	\$936,947		
MILFORD	Hartshorn Rd.					Project ID:	42087
Scope:	Replace Hartshorn Bridge over Hartshorn Brook (Bridge ID 102/165)					Managed By:	Muni/Local
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.: No
PE	2020	\$0	\$92,545	\$23,136	\$115,682	SB367-4-Cents, Town	CAA Status: E-19
ROW	2021	\$0	\$4,207	\$1,052	\$5,258	SB367-4-Cents, Town	
CON	2026	\$0	\$286,260	\$71,565	\$357,825	SB367-4-Cents, Town	
CON	2027	\$0	\$244,633	\$61,158	\$305,791	SB367-4-Cents, Town	
	MTP Total:	\$0	\$627,645	\$156,911	\$784,556		

**2019 – 2045 Metropolitan Transportation Plan
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MILFORD	NH 101A/NH 13						Project ID:	14492
Scope:	Improvements to the "Oval" to improve traffic flow based on ongoing studies within the Town [Earmarks NH038 & NH058]						Managed By:	Muni/Local
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.:	No
PE	2019	\$178,988	\$0	\$44,747	\$223,735	FHWA Earmarks, Towns	CAA Status:	E-51
ROW	2020	\$160,000	\$0	\$40,000	\$200,000	FHWA Earmarks, Towns		
CON	2020	\$650,164	\$0	\$162,541	\$812,705	FHWA Earmarks, Towns		
	MTP Total:	\$989,152	\$0	\$247,288	\$1,236,440			
NASHUA - CONCORD	F.E. Everett Turnpike						Project ID:	29408
Scope:	Intelligent Transportation System (ITS) deployment of F.E. Everett Turnpike						Managed By:	NHDOT
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.:	Yes
CON	2019	\$0	\$1,657,923	\$0	\$1,657,923	Turnpike Capital	CAA Status:	E-7
CON	2020	\$0	\$10,000	\$0	\$10,000	Turnpike Capital		
	MTP Total:	\$0	\$1,667,923	\$0	\$1,667,923			
NASHUA-MERR-BEDFORD-MANCH	F.E. Everett Turnpike						Project ID:	13761
Scope:	F.E. Everett Turnpike widening of 2-lane section from Exit 8 (Nashua) to North of I-293 (Manchester)						Managed By:	NHDOT
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.:	Yes
PE	2019	\$0	\$3,500,000	\$0	\$3,500,000	Turnpike Capital	CAA Status:	N/E
PE	2020	\$0	\$3,000,000	\$0	\$3,000,000	Turnpike Capital		
PE	2021	\$0	\$1,025,500	\$0	\$1,025,500	Turnpike Capital		
ROW	2019	\$0	\$300,000	\$0	\$300,000	Turnpike Capital		
ROW	2020	\$0	\$2,500,000	\$0	\$2,500,000	Turnpike Capital		
ROW	2021	\$0	\$4,102,000	\$0	\$4,102,000	Turnpike Capital		
CON	2021	\$0	\$10,665,200	\$0	\$10,665,200	Turnpike Capital		
CON	2022	\$0	\$29,025,547	\$0	\$29,025,547	Turnpike Capital		
CON	2023	\$0	\$38,069,897	\$0	\$38,069,897	Turnpike Capital		
CON	2024	\$0	\$25,658,463	\$0	\$25,658,463	Turnpike Capital		
CON	2025	\$0	\$19,847,983	\$0	\$19,847,983	Turnpike Capital		
	MTP Total:	\$0	\$137,694,590	\$0	\$137,694,590			
NASHUA	NH 101A						Project ID:	10136A
Scope:	Widening & improvements, Phase I: Sunapee St. to Blackstone Dr.						Managed By:	NHDOT
Phase	FY	Federal	State	Other	Total	Funding Source(s)	Regionally Sig.:	No
PE	2019	\$132,962	\$0	\$0	\$132,962	STP_Areas 200k, Toll Cred	CAA Status:	N/E
PE	2020	\$789,635	\$0	\$0	\$789,635	STP_Areas 200k, Toll Cred		
ROW	2020	\$219,232	\$0	\$0	\$219,232	STP_Areas 200k, Toll Cred		
ROW	2024	\$2,988,369	\$0	\$0	\$2,988,369	STP_Areas 200k, Toll Cred		
CON	2025	\$4,510,239	\$0	\$574,784	\$5,085,022	STP_Areas 200k, Toll Cred, Non-Participating		
	MTP Total:	\$8,640,436	\$0	\$574,784	\$9,215,220			

**2019 – 2045 Metropolitan Transportation Plan
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NASHUA	NH 101A						Project ID:	10136B
Scope:	Widening & improvements, Phase II: Somerset Pkwy to Sunapee St. & Blackstone to Celina Ave						Managed By:	NHDOT
							Regionally Sig.:	Yes
							CAA Status:	N/E
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2020	\$1,128,050	\$0	\$0	\$1,128,050	STP_Areas 200k, Toll Cred		
PE	2021	\$641,767	\$0	\$0	\$641,767	STP_Areas 200k, Toll Cred		
ROW	2021	\$3,709,575	\$0	\$0	\$3,709,575	STP_Areas 200k, Toll Cred		
CON	2026	\$6,769,914	\$0	\$0	\$6,769,914	STP_Areas 200k, Toll Cred		
	MTP Total:	\$12,249,305	\$0	\$0	\$12,249,305			
NASHUA	East Hollis St. & Bridge St.						Project ID:	16314
Scope:	Intersection improvements at East Hollis St. and Bridge St. from C St. to the Hudson town line						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	N/E
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2019	\$200,000	\$0	\$0	\$200,000	STP_Areas 200k, Toll Cred		
ROW	2019	\$223,837	\$0	\$0	\$223,837	STP_Areas 200k, Toll Cred		
CON	2020	\$2,850,923	\$0	\$0	\$2,850,923	STP_Areas 200k, Toll Cred		
	MTP Total:	\$3,274,760	\$0	\$0	\$3,274,760			
NASHUA	Charlotte Ave Elementary School						Project ID:	28739
Scope:	Construct new sidewalk, reconstruct crosswalk to meet ADA standards						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
CON	2019	\$100,000	\$0	\$0	\$100,000	Safe Routes to School		
	MTP Total:	\$100,000	\$0	\$0	\$100,000			
NASHUA	FEET & I-95						Project ID:	42116
Scope:	Ashphalt roof replacement for salt storage facilities						Managed By:	NHDOT
							Regionally Sig.:	No
							CAA Status:	E-28
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2019	\$0	\$0	\$20,000	\$20,000	Turnpike Renewal		
CON	2019	\$0	\$0	\$300,000	\$300,000	Turnpike Renewal		
	MTP Total:	\$0	\$0	\$320,000	\$320,000			
NASHUA	East Hollis St.						Project ID:	40660
Scope:	Improvements to East Hollis St and its intersections						Managed By:	NHDOT
							Regionally Sig.:	No
							CAA Status:	N/E
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2022	\$322,943	\$0	\$80,736	\$403,678	STP-5 to 200K, City		
ROW	2024	\$169,811	\$0	\$42,453	\$212,264	STP-5 to 200K, City		
CON	2025	\$2,960,407	\$0	\$740,102	\$3,700,509	STP-5 to 200K, City		
	MTP Total:	\$3,453,161	\$0	\$863,290	\$4,316,451			

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NASHUA - MANCHESTER NH Capital Corridor						Project ID:	40818
CONCORD						Managed By:	NHDOT
Scope:		Design, Environmental Review, and Financial Plan for Bus Service Expansion				Region Sig:	No
						CAA Status:	E-34
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
Other	2019	\$2,000,000	\$0	\$0	\$2,000,000	FTA 5307, Toll Credit	
Other	2020	\$2,051,000	\$0	\$0	\$2,051,000	FTA 5307, Toll Credit	
	MTP Total:	\$4,051,000	\$0	\$0	\$4,051,000		
NASHUA						Project ID:	41585
Scope:		DW Highway				Managed By:	Muni/Local
		DW Highway pedestrian safety improvements				Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2027	\$19,317	\$0	\$4,829	\$24,146	TAP, City	
ROW	2027	\$5,519	\$0	\$1,380	\$6,899	TAP, City	
CON	2027	\$361,506	\$0	\$90,376	\$451,882	TAP, City	
	MTP Total:	\$386,342	\$0	\$96,585	\$482,927		
NASHUA						Project ID:	41586
Scope:		Walnut St/Chestnut St/Central St				Managed By:	Muni/Local
		Safety, capacity and multimodal access improvements to the Walnut St. Oval				Regionally Sig.:	No
						CAA Status:	E-51
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2027	\$225,182	\$0	\$56,296	\$281,478	STP, City	
ROW	2027	\$55,192	\$0	\$13,798	\$68,990	STP, City	
CON	2029	\$1,971,447	\$0	\$492,862	\$2,464,309	STP, City	
	MTP Total:	\$2,251,822	\$0	\$562,955	\$2,814,777		
NASHUA						Project ID:	41742
Scope:		Heritage Rail Trail East				Managed By:	Muni/Local
		Construct the Heritage Rail Trail East				Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2019	\$62,592	\$0	\$15,648	\$78,240	CMAQ, City	
PE	2020	\$42,792	\$0	\$10,698	\$53,490	CMAQ, City	
CON	2020	\$795,214	\$0	\$198,803	\$994,017	CMAQ, City	
	MTP Total:	\$900,598	\$0	\$225,149	\$1,125,747		
NASHUA						Project ID:	41745
Scope:		Nashua Transit System				Managed By:	Muni/Local
		Expand NTS service on NH 101A to Walmart in Amherst				Regionally Sig.:	No
						CAA Status:	E-30
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
Other	2019	\$135,372	\$0	\$33,843	\$169,215	CMAQ, City	
Other	2020	\$121,372	\$0	\$30,343	\$151,715	CMAQ, City	
Other	2021	\$121,372	\$0	\$30,343	\$151,715	CMAQ, City	
	MTP Total:	\$378,116	\$0	\$94,529	\$472,646		

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NASHUA		Nashua Transit System					Project ID:	NTS5307
Scope:		NTS operating assistance; ADA, capital preventative maintenance, planning. FTA funds.					Managed By:	Muni/Local
							Region Sig:	No
							CAA Status:	E-21
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
Other	2019	\$1,374,153	\$0	\$1,011,530	\$2,385,683	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2020	\$1,401,637	\$0	\$1,031,760	\$2,433,397	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2021	\$1,429,669	\$0	\$1,052,395	\$2,482,064	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2022	\$1,458,263	\$0	\$1,073,443	\$2,531,706	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2023	\$1,487,428	\$0	\$1,094,912	\$2,582,340	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2024	\$1,517,177	\$0	\$1,116,810	\$2,633,987	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2025	\$1,547,520	\$0	\$1,139,146	\$2,686,666	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2026	\$1,578,470	\$0	\$1,161,930	\$2,740,400	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2027	\$1,610,040	\$0	\$1,185,168	\$2,795,208	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2028	\$1,642,241	\$0	\$1,208,871	\$2,851,112	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2029	\$1,675,085	\$0	\$1,233,049	\$2,908,134	FTA 5307 Capital & Operating Prog, Non Participating		
Other	2030	\$1,708,587	\$0	\$1,257,710	\$2,966,297	FTA 5307 Capital & Operating Prog, Non Participating		
MTP Total:		\$18,430,269	\$0	\$13,566,725	\$31,996,994			
NASHUA		Nashua Transit System					Project ID:	NTS5310
Scope:		NTS FTA 5310 Formula Funds for Mobility of Seniors & Individuals with Disabilities					Managed By:	Muni/Local
							Region Sig:	No
							CAA Status:	E-30
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
Other	2019	\$56,146	\$4,954	\$4,954	\$66,054	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2020	\$57,269	\$5,053	\$5,053	\$67,376	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2021	\$58,415	\$5,154	\$5,154	\$68,724	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2022	\$59,582	\$5,257	\$5,257	\$70,096	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2023	\$60,774	\$5,362	\$5,362	\$71,498	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2024	\$61,990	\$5,470	\$5,470	\$72,930	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2025	\$63,230	\$5,579	\$5,579	\$74,388	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2026	\$64,495	\$5,691	\$5,691	\$75,877	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2027	\$65,784	\$5,804	\$5,804	\$77,392	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2028	\$67,100	\$5,921	\$5,921	\$78,942	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2029	\$68,442	\$6,039	\$6,039	\$80,520	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
Other	2030	\$69,811	\$6,160	\$6,160	\$82,131	FTA 5310 Capital Prog, NH Hwy Fund, Non Participating		
MTP Total:		\$753,038	\$66,445	\$66,445	\$885,927			

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NASHUA	Nashua Transit System					Project ID:	NTS5339
Scope:	NTS FTA 5339 Formula Funds for Capital Projects for Buses & Related Facilities					Managed By:	Muni/Local
						Region Sig:	No
						CAA Status:	E-31
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
Other	2019	\$174,096	\$15,361	\$15,361	\$204,819	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2020	\$177,579	\$15,669	\$15,669	\$208,916	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2021	\$181,130	\$15,982	\$15,982	\$213,094	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2022	\$184,753	\$16,302	\$16,302	\$217,356	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2023	\$188,448	\$16,628	\$16,628	\$221,704	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2024	\$192,216	\$16,960	\$16,960	\$226,136	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2025	\$196,061	\$17,300	\$17,300	\$230,661	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2026	\$199,982	\$17,645	\$17,645	\$235,272	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2027	\$203,981	\$17,998	\$17,998	\$239,977	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2028	\$208,061	\$18,358	\$18,358	\$244,777	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2029	\$212,223	\$18,726	\$18,726	\$249,675	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
Other	2030	\$216,467	\$19,100	\$19,100	\$254,667	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Non Particip	
	MTP Total:	\$2,334,996	\$206,029	\$206,029	\$2,747,054		
NASHUA	Nashua Transit System					Project ID:	NTS5339B
Scope:	NTS FTA 5339(b) Discretionary/Competitive Funds for Capital Projects					Managed By:	Muni/Local
						Region Sig:	No
						CAA Status:	E-28
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2019	\$63,200	\$7,900	\$7,900	\$79,000	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Other	
CON	2020	\$511,200	\$63,900	\$63,900	\$639,000	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Other	
Other	2020	\$505,600	\$44,612	\$44,612	\$594,824	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Other	
	MTP Total:	\$1,080,000	\$116,412	\$116,412	\$1,312,824		
NASHUA	Nashua Transit System					Project ID:	NTS5339C
Scope:	NTS FTA 5339(c) "Lo/No" Discretionary Funds for the Purchase of 2 electric hybrid buses					Managed By:	Muni/Local
						Region Sig:	No
						CAA Status:	E-30
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
Other	2019	\$1,105,000	\$97,500	\$97,500	\$1,300,000	FTA 5339 Bus & Bus Facilities, NH Hwy Fund, Other	
	TIP Total:	\$1,105,000	\$97,500	\$97,500	\$1,300,000		
NASHUA	Nashua Transit System					Project ID:	60900E
Scope:	Nashua Transit System transit center rehabilitation					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	E-28
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
Other	2019	\$63,200	\$7,900	\$7,900	\$79,000	FTA 5339, NHDOT Op Budget, City	
Other	2020	\$511,200	\$63,900	\$63,900	\$639,000	FTA 5339, NHDOT Op Budget, City	
	MTP Total:	\$574,400	\$71,800	\$71,800	\$718,000		
NASHUA-MERRIMACK	F.E. Everett Turnpike					Project ID:	41097
Scope:	F.E. Everett Turnpike resurfacing from Nashua MM 5.6 to 9.1, Exit 10 & 11 Ramps					Managed By:	NHDOT
						Regionally Sig.:	No
						CAA Status:	E-10
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
CON	2019	\$0	\$4,098,511	\$0	\$4,098,511	Turnpike Renewal & Replacement	
	MTP Total:	\$0	\$4,098,511	\$0	\$4,098,511		

**2019 – 2045 Metropolitan Transportation Plan
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PELHAM	Main Street						Project ID:	16145
Scope:	Bridge and Culvert Replacement over Beaver Brook (Bridge IDs 110/090 and 111/090)						Managed By:	NHDOT
							Regionally Sig.:	No
							CAA Status:	E-19
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2019	\$112,805	\$0	\$0	\$112,805	STP-5 to 200K, Toll Credit		
PE	2020	\$80,977	\$0	\$0	\$80,977	STP-5 to 200K, Toll Credit		
PE	2021	\$77,110	\$0	\$0	\$77,110	STP-5 to 200K, Toll Credit		
PE	2022	\$69,952	\$0	\$0	\$69,952	STP-5 to 200K, Toll Credit		
ROW	2022	\$51,704	\$0	\$0	\$51,704	STP-5 to 200K, Toll Credit		
CON	2023	\$26,199	\$2,064,190	\$0	\$2,090,390	STP-5 to 200k, Toll Credit, SB367-4-Cents		
	MTP Total:	\$418,748	\$2,064,190	\$0	\$2,482,938			
PELHAM	Willow Street						Project ID:	26762
Scope:	Bridge Replacement over Beaver Brook (Bridge ID 105/069){State Aid Bridge Program}						Managed By:	Muni/Local
							Regionally Sig.:	Yes
							CAA Status:	E-19
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2019	\$0	\$254,257	\$72,648	\$326,905	SB367-4-Cents, Town		
ROW	2019	\$0	\$20,000	\$5,000	\$25,000	SB367-4-Cents, Town		
CON	2019	\$0	\$555,124	\$206,818	\$761,942	SB367-4-Cents, Town		
CON	2020	\$0	\$695,124	\$173,781	\$868,905	SB367-4-Cents, Town		
	MTP Total:	\$0	\$1,524,505	\$458,247	\$1,982,752			
PELHAM	Old Bridge St						Project ID:	29450
Scope:	Bridge Rehabilitation - Old Bridge St over Beaver Brook - Br. #109/081						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-19
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2022	\$0	\$115,021	\$28,755	\$143,776	SB367-4-Cents, Town		
ROW	2022	\$0	\$53,086	\$13,272	\$66,358	SB367-4-Cents, Town		
CON	2022	\$0	\$668,005	\$167,001	\$835,006	SB367-4-Cents, Town		
	MTP Total:	\$0	\$836,112	\$209,028	\$1,045,140			
PELHAM	NH 128 & Sherburne Rd						Project ID:	41751
Scope:	Intersection improvements at the intersection of NH 128 & Sherburne Rd and Mammoth Rd & NH 111A						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-51
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2019	\$108,000	\$0	\$72,000	\$180,000	CMAQ, Towns		
PE	2020	\$73,836	\$0	\$49,224	\$123,060	CMAQ, Towns		
ROW	2020	\$92,295	\$0	\$61,530	\$153,825	CMAQ, Towns		
CON	2021	\$978,035	\$0	\$652,023	\$1,630,058	CMAQ, Towns		
	MTP Total:	\$1,252,166	\$0	\$834,777	\$2,086,943			

**2019 – 2045 Metropolitan Transportation Plan
State of New Hampshire Ten Year Plan Projects**

WILTON - MILFORD AMHERST-BEDFORD	NH101						Project ID: 13692 Managed By: NHDOT Regionally Sig.: No CAA Status: E-2
Scope:	PE and ROW for corridor improvements from NH 31 in Wilton to Wallace Rd in Bedford						
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2019	\$275,000	\$0	\$0	\$275,000	NHS, Toll Credit	
	MTP Total:	\$275,000	\$0	\$0	\$275,000		
WILTON - MILFORD AMHERST-BEDFORD	NH101						Project ID: 13692D Managed By: NHDOT Regionally Sig.: No CAA Status: E-51
Scope:	Traffic and safety improvements consistent with the intent of the 2002 corridor study						
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2019	\$165,000	\$0	\$0	\$165,000	STP-State Flexible, Toll Credit	
PE	2020	\$495,000	\$0	\$0	\$495,000	STP-State Flexible, Toll Credit	
ROW	2019	\$275,000	\$0	\$0	\$275,000	STP-State Flexible, Toll Credit	
ROW	2021	\$2,809,998	\$0	\$0	\$2,809,998	STP-State Flexible, Toll Credit	
CON	2022	\$4,048,853	\$0	\$0	\$4,048,853	STP-State Flexible, Toll Credit	
	MTP Total:	\$7,793,852	\$0	\$0	\$7,793,852		
WILTON	Old County Farm Rd						Project ID: 15768 Managed By: Muni/Local Regionally Sig.: No CAA Status: E-19
Scope:	Bridge replacement over Blood Brook (Bridge ID 060/118) {State Aid Bridge Program}						
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2025	\$0	\$42,939	\$10,735	\$53,674	State Aid Bridge, Towns	
ROW	2025	\$0	\$4,771	\$1,193	\$5,964	State Aid Bridge, Towns	
CON	2025	\$0	\$162,214	\$40,554	\$202,768	State Aid Bridge, Towns	
	MTP Total:	\$0	\$209,925	\$52,481	\$262,406		
WILTON	Stage Coach Road						Project ID: 26201 Managed By: Muni/Local Regionally Sig.: No CAA Status: E-19
Scope:	Bridge replacement over Burton Pond (Bridge ID 086/142)						
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2021	\$0	\$33,648	\$8,412	\$42,060	State Aid Bridge, Towns	
ROW	2021	\$0	\$5,608	\$1,402	\$7,010	State Aid Bridge, Towns	
CON	2021	\$0	\$145,809	\$36,452	\$182,261	State Aid Bridge, Towns	
	MTP Total:	\$0	\$185,065	\$46,266	\$231,331		
WILTON	King Brook Rd						Project ID: 15767 Managed By: Muni/Local Regionally Sig.: No CAA Status: E-19
Rte/Rd/Entity:	Rehabilitate bridge over King Brook (Bridge ID 074/060) {State Aid Bridge Program}						
Scope:							
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2019	\$0	\$160,000	\$40,000	\$200,000	State Aid Bridge, Towns	
ROW	2019	\$0	\$4,000	\$1,000	\$5,000	State Aid Bridge, Towns	
CON	2020	\$0	\$54,000	\$13,500	\$67,500	State Aid Bridge, Towns	
CON	2021	\$0	\$218,000	\$54,500	\$272,500	State Aid Bridge, Towns	
	MTP Total:	\$0	\$436,000	\$109,000	\$545,000		

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Recommended Fiscally Constrained Projects**

AMHERST	NH 101A						Project ID:	MTP2015.1
Scope:	Reconstruct railroad crossings at multiple locations at or adjacent to NH 101A: NH 101A/Amherst Village, Old Nashua Rd, Northern Blvd and North Hollis Rd.						Managed By:	MPO MTP
							Regionally Sig.:	No
							CAA Status:	E-1
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PLAN	2029	\$2,036,816	\$0	\$509,204	\$2,546,020	STP,HSIP		
	MTP Total:	\$2,036,816	\$0	\$509,204	\$2,546,020			
AMHERST	B & M Rail Line ROW						Project ID:	MTP2018.1
Scope:	Phase 2: Multi-modal path along B&M rail corridor Baboosic Lake Rd to Walnut Hill Rd. 8,300 ft.						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2029	\$79,149	\$0	\$19,787	\$98,936	TAP/STP, Towns		
ROW	2029	\$158,297	\$0	\$39,574	\$197,872	TAP/STP, Towns		
CON	2030	\$487,002	\$0	\$121,750	\$608,752	TAP/STP, Towns		
	MTP Total:	\$724,448	\$0	\$181,112	\$905,560			
AMHERST	B & M Rail Line ROW						Project ID:	MTP2018.2
Scope:	Phase 3: Multi-modal path along B&M rail corridor Thornton Ferry Rd. to Mulberry Ln. 4,400 ft						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2031	\$66,589	\$0	\$16,647	\$83,237	TAP/STP, Towns		
ROW	2031	\$166,473	\$0	\$41,618	\$208,092	TAP/STP, Towns		
CON	2032	\$312,984	\$0	\$78,246	\$391,230	TAP/STP, Towns		
	MTP Total:	\$546,047	\$0	\$136,512	\$682,558			
AMHERST	B & M Rail Line ROW						Project ID:	MTP2018.3
Scope:	Phase 4: Multi-modal path along B&M rail corridor Mulberry Ln. to Merrimack Rd. 4,000 ft						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2033	\$52,522	\$0	\$13,130	\$65,652	TAP/STP, Towns		
ROW	2034	\$175,072	\$0	\$43,768	\$218,840	TAP/STP, Towns		
CON	2034	\$454,825	\$0	\$113,706	\$568,531	TAP/STP, Towns		
	MTP Total:	\$682,418	\$0	\$170,605	\$853,023			
AMHERST	Non-Motorized Path						Project ID:	MTP2018.4
Scope:	Phase 5: Multi-modal path along Town ROW Merrimack Rd. to River Rd. 6,750 ft						Managed By:	Muni/Local
							Regionally Sig.:	No
							CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)		
PE	2035	\$49,097	\$0	\$12,274	\$61,371	TAP/STP, Towns		
CON	2036	\$472,023	\$0	\$118,006	\$590,029	TAP/STP, Towns		
	MTP Total:	\$521,120	\$0	\$130,280	\$651,400			

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Recommended Fiscally Constrained Projects**

AMHERST	Non-Motorized Path					Project ID:	MTP2018.5
Scope:	Phase 6: Multi-modal path along Town ROW River Rd. to Amherst Middle School 3,550 ft					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2037	\$38,725	\$0	\$9,681	\$48,406	TAP/STP, Towns	
CON	2038	\$364,029	\$0	\$91,007	\$455,036	TAP/STP, Towns	
	MTP Total:	\$402,754	\$0	\$100,688	\$503,442		
BROOKLINE	NH 13					Project ID:	MTP2018.6
Scope:	Realignment of NH 13/South Main St. intersection					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-53
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2029	\$52,766	\$0	\$13,191	\$65,957	STP, Towns	
ROW	2029	\$26,383	\$0	\$6,596	\$32,979	STP, Towns	
CON	2030	\$211,063	\$0	\$52,766	\$263,829	STP, Towns	
	MTP Total:	\$290,212	\$0	\$72,553	\$362,765		
HUDSON	NH 102, Derry Rd					Project ID:	MTP2015.2
Scope:	Phase II: Continue Pedestrian/Bike Lane on NH 102 from Towhee Dr to Megan Dr					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2033	\$98,475	\$0	\$24,619	\$123,095	TAP/STP, Towns	
ROW	2034	\$67,324	\$0	\$16,831	\$84,155	TAP/STP, Towns	
CON	2035	\$517,807	\$0	\$129,451	\$647,258	TAP/STP, Towns	
	MTP Total:	\$683,607	\$0	\$170,902	\$854,508		
HUDSON	NH 102, Derry Rd					Project ID:	MTP2015.3
Scope:	Phase III: Continue Pedestrian/Bike Lane on NH 102 from Phillips Dr to the Hudson Mall					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
	2035	\$45,622	\$0	\$11,405	\$57,027	TAP/STP, Towns	
ROW	2036	\$31,190	\$0	\$7,798	\$38,988	TAP/STP, Towns	
CON	2037	\$239,891	\$0	\$59,972	\$299,863	TAP/STP, Towns	
	MTP Total:	\$316,703	\$0	\$79,175	\$395,878		
HUDSON	NH 3A, Lowell Rd					Project ID:	MTP2015.4
Scope:	Continue Sidewalk on NH 3A, Lowell Rd from Birch St to Pelham Rd					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2037	\$39,982	\$0	\$9,995	\$49,977	TAP/STP, Towns	
CON	2038	\$205,006	\$0	\$51,252	\$256,258	TAP/STP, Towns	
	MTP Total:	\$244,988	\$0	\$61,247	\$306,235		
HUDSON	NH 3A, Lowell Rd					Project ID:	MTP2015.5
Scope:	Continue Sidewalk on NH 3A, Lowell Rd from Nottingham Sq to Executive Dr					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2039	\$50,457	\$0	\$12,613	\$63,070	TAP/STP, Towns	
CON	2040	\$293,210	\$0	\$73,302	\$366,512	TAP/STP, Towns	
	MTP Total:	\$343,666	\$0	\$85,915	\$429,582		

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Recommended Fiscally Constrained Projects**

MERRIMACK	Baboosic Lake Rd & Woodbury Rd.					Project ID:	MTP2015.6
Scope:	Continue Sidewalk on Baboosic Lake Rd from DW Hwy to O'Gara Dr. and on Woodbury Rd. from DW Hwy to McElwain St.					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2021	\$82,449	\$0	\$20,612	\$103,062	TAP, Towns	
ROW	2021	\$25,240	\$0	\$6,310	\$31,550	TAP, Towns	
CON	2022	\$1,228,690	\$0	\$307,172	\$1,535,862	TAP, Towns	
	MTP Total:	\$1,336,379	\$0	\$334,095	\$1,670,473		
MILFORD	North River Rd.					Project ID:	MTP2017.2
Scope:	Bridge replacement on North River Rd. over Hartshorn Brook					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-19
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2029	\$105,532	\$0	\$26,383	\$131,914	STP, Towns	
CON	2030	\$649,336	\$0	\$162,334	\$811,669	STP, Towns	
	MTP Total:	\$754,867	\$0	\$188,717	\$943,584		
MILFORD	Purgatory Rd.					Project ID:	MTP2017.3
Scope:	Bridge replacement on Purgatory Rd. over Purgatory Brook					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-19
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2029	\$105,532	\$0	\$26,383	\$131,914	STP, Towns	
CON	2030	\$638,513	\$0	\$159,628	\$798,142	STP, Towns	
	MTP Total:	\$744,045	\$0	\$186,011	\$930,056		
MILFORD	NH 101A					Project ID:	MTP2018.8
Scope:	Construct new sidewalk and bicycle lane along 2600 ft. section of Nashua St. between the Medlyn Monument and Walgreen's Pharmacy					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2033	\$70,029	\$0	\$17,507	\$87,536	TAP/STP, Towns	
ROW	2033	\$7,295	\$0	\$1,459	\$8,754	TAP/STP, Towns	
CON	2034	\$837,835	\$0	\$209,459	\$1,047,294	TAP/STP, Towns	
	MTP Total:	\$915,159	\$0	\$228,425	\$1,143,584		
MILFORD	Osgood Rd. & Melendy Rd.					Project ID:	MTP2018.9
Scope:	Construct sidewalk and multi-use connection for pedestrians and on-motorized vehicles from West St/Osgood Rd to Leisure Acres mobile home park on Melendy Rd.					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2031	\$27,746	\$0	\$5,392	\$33,138	TAP/STP, Towns	
ROW	2031	\$6,936	\$0	\$1,387	\$8,324	TAP/STP, Towns	
CON	2032	\$455,249	\$0	\$113,812	\$569,062	TAP/STP, Towns	
	MTP Total:	\$489,931	\$0	\$120,592	\$610,523		

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Recommended Fiscally Constrained Projects**

MILFORD	Various Pedestrian Linkages					Project ID:	MTP2018.10
Scope:	Construct 200 ft. pedestrian bridge over the Souhegan River from 135 Elm St. to 34 N. River Rd. and 3000 ft. trail connecting to Keyes Mem. Park and MCAA fields.					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2029	\$116,085	\$0	\$29,021	\$145,106	TAP/STP, Towns	
ROW	2029	\$5,277	\$0	\$1,319	\$6,596	TAP/STP, Towns	
CON	2030	\$681,802	\$0	\$170,451	\$852,253	TAP/STP, Towns	
	MTP Total:	\$803,164	\$0	\$200,791	\$1,003,955		
NASHUA	NH 130, Broad St					Project ID:	MTP2015.7
Scope:	NH 130 reconstruction from Coburn Ave to Coliseum Ave including Dublin Ave to provide shoulders and safety improvements					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-10
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2035	\$368,229	\$0	\$92,057	\$460,286	STP, City	
ROW	2035	\$24,549	\$0	\$6,137	\$30,686	STP, City	
CON	2036	\$6,971,795	\$0	\$1,742,949	\$8,714,744	STP, City	
	MTP Total:	\$7,364,572	\$0	\$1,841,143	\$9,205,716		
NASHUA	Main St					Project ID:	MTP2015.8
Scope:	Reconstruction from Hollis St to Orchard Ave					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-10
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2037	\$258,165	\$0	\$64,541	\$322,706	STP, City	
CON	2038	\$2,912,232	\$0	\$728,058	\$3,640,290	STP, City	
	MTP Total:	\$2,912,232	\$0	\$728,058	\$3,640,290		
NASHUA	Main St					Project ID:	MTP2017.1
Scope:	Reconstruct the Main St Railroad Crossing (Hillsborough Branch)					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-1
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
CON	2029	\$369,360	\$0	\$92,340	\$461,701	STP, City	
	MTP Total:	\$369,360	\$0	\$92,340	\$461,701		
NASHUA	Broad Street Parkway					Project ID:	MTP2017.4
Scope:	Construct an interchange along the Broad Street Parkway connecting with Franklin St. To be included in next TYP phase per agreement with NHDOT					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	N/E
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
CON	2030	\$763,608	\$0	\$190,902	\$954,510	STP, City	
CON	2031	\$763,608	\$0	\$190,902	\$954,510	STP, City	
	MTP Total:	\$763,608	\$0	\$190,902	\$954,510		
NASHUA	F.E. Everett Turnpike SB Exit 5					Project ID:	L RTP_2016.1
Scope:	Reconfigure southbound ramp to connect to the traffic signal on Main Dunstable Rd instead of West Hollis St.					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	E-53
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2030	\$113,974	\$28,494	\$0	\$142,468	STP, Turnpike	
CON	2031	\$835,810	\$208,952	\$0	\$1,044,762	STP, Turnpike	
	MTP Total:	\$949,784	\$237,446	\$0	\$1,187,230		

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Recommended Fiscally Constrained Projects**

NASHUA	Bridge St & Canal St.					Project ID:	MTP2018.11
Scope:	Complete Streets project entailing curb adjustments, bike lanes, sidewalks & handicapped ramps					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	E-53
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2031	\$221,965	\$0	\$55,491	\$277,456	STP, City	
CON	2032	\$1,138,123	\$0	\$284,531	\$1,422,654	STP, City	
	MTP Total:	\$1,360,088	\$0	\$340,022	\$1,700,110		
NASHUA	Taylor Falls & Veterans Memorial Bridge					Project ID:	MTP2018.12
Scope:	Moderate rehabilitation of the bridge superstructure					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	E-19
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2029	\$211,063	\$0	\$52,766	\$263,829	SAB, STP, City	
CON	2030	\$1,082,226	\$0	\$270,556	\$1,352,782	SAB, STP, City	
CON	2031	\$1,109,823	\$0	\$277,456	\$1,387,278	SAB, STP, City	
	MTP Total:	\$2,403,112	\$0	\$600,778	\$3,003,890		
NASHUA	Lock St/Whitney St.					Project ID:	MTP2018.13
Scope:	Bicycle & pedestrian improvements along routes to Mt. Pleasant Elementary School					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2031	\$86,475	\$0	\$21,619	\$108,094	TAP, STP, City	
ROW	2031	\$27,746	\$0	\$6,936	\$34,682	TAP, STP, City	
CON	2032	\$1,019,822	\$0	\$254,956	\$1,274,778	TAP, STP, City	
	MTP Total:	\$1,134,043	\$0	\$283,511	\$1,417,554		
NASHUA	Kinsley St.					Project ID:	MTP2018.14
Scope:	Construct new sidewalks and bike along entire length of Kinsley St.					Managed By:	Muni/Local
						Regionally Sig.:	No
						CAA Status:	E-33
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2030	\$158,297	\$0	\$39,574	\$197,872	STP, City	
CON	2031	\$1,160,847	\$0	\$290,212	\$1,451,059	STP, City	
	MTP Total:	\$1,319,144	\$0	\$329,786	\$1,648,930		
NASHUA	FEE Turnpike					Project ID:	LRTP_2017.5
Scope:	Construct southbound off-ramp to Dozer Rd.					Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	N/E
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2035	\$0	\$76,714	\$0	\$76,714	Turnpike	
CON	2036	\$0	\$1,573,410	\$0	\$1,573,410	Turnpike	
	MTP Total:	\$0	\$1,650,125	\$0	\$1,650,125		

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Recommended Fiscally Constrained Projects**

NASHUA - TYNGSBOROUGH		F.E. Everett Turnpike				Project ID:	MTP2015.9
Scope:		Addition of southbound off-ramp to Exit 36 across the Mass. state line in Tyngsborough to provide southbound access from the FEE Turnpike to the Pheasant Lane Mall.				Managed By:	MPO MTP
						Regionally Sig.:	No
						CAA Status:	N/E
Phase	FY	Federal	State	Other	Total	Funding Source(s)	
PE	2038	\$0	\$3,309,354	\$0	\$3,309,354	Turnpike	
ROW	2038	\$0	\$3,309,354	\$0	\$3,309,354	Turnpike	
CON	2039	\$0	\$13,574,972	\$0	\$13,574,972	Turnpike	
CON	2040	\$0	\$13,921,134	\$0	\$13,921,134	Turnpike	
MTP Total:		\$0	\$34,114,815	\$0	\$34,114,815		

**2019 – 2045 Metropolitan Transportation Plan
Nashua MPO Illustrative Projects**

MILFORD	NH 101							Project ID:	LRTP_2014
Scope:	Construct a new full access interchange from NH 101 Bypass to the east of the Perry Road underpass, to service anticipated commercial/industrial/mixed-use development in West Milford							Managed By:	MPO MTP
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		Regionally Sig.:	No
MTP	2035	\$15,436,111	\$0	\$3,859,028	\$19,295,139	STP, Toll Credit		CAA Status:	N/A Illustrative
	MTP Total:	\$15,436,111	\$0	\$3,859,028	\$19,295,139				
HUDSON - LITCHFIELD	US 3/NH 3A							Project ID:	LRTP_2010
MERRIMACK-NASHUA	Construct a northern crossing of the Merrimack River to provide a 4-lane roadway connecting NH 102 in Hudson, NH 3A in Litchfield and US 3 in Merrimack & FEE Turnpike in Nashua.							Managed By:	MPO MTP
Scope:								Regionally Sig.:	No
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		CAA Status:	N/A Illustrative
MTP	2038	\$7,114,596	\$7,114,596	\$0	\$14,229,193	STP, Toll Credit, Turnpike			Yes
MTP	2039	\$14,684,527	\$14,684,527	\$0	\$29,369,053	STP, Toll Credit, Turnpike			
MTP	2040	\$15,154,430	\$15,154,430	\$0	\$30,308,861	STP, Toll Credit, Turnpike			
MTP	2041	\$31,278,745	\$31,278,745	\$0	\$62,557,490	STP, Toll Credit, Turnpike			
MTP	2042	\$36,314,623	\$36,314,623	\$0	\$72,629,247	STP, Toll Credit, Turnpike			
MTP	2043	\$8,328,153	\$8,328,153	\$0	\$16,656,307	STP, Toll Credit, Turnpike			
MTP	2044	\$17,189,309	\$17,189,309	\$0	\$34,378,618	STP, Toll Credit, Turnpike			
MTP	2045	\$17,739,367	\$17,739,367	\$0	\$35,478,734	STP, Toll Credit, Turnpike			
	MTP Total:	\$147,803,751	\$147,803,751	\$0	\$295,607,502				
NASHUA - MANCHESTER	NH Main Line							Project ID:	LRTP_2014
CONCORD	Extend MBTA passenger rail service to New Hampshire							Managed By:	Muni/Local
Scope:								Regionally Sig.:	Yes
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		CAA Status:	N/A Illustrative
MTP	2029	\$159,371,611	\$0	\$0	\$159,371,611	FTA 5309 Cap Investment			
	MTP Total:	\$159,371,611	\$0	\$0	\$159,371,611				
WILTON - MILFORD -	NH101							Project ID:	LRTP_2010
AMHERST	Widening of NH 101 between west end of bypass and Bedford town line to four-lane controlled access highway.							Managed By:	NHDOT
Scope:								Regionally Sig.:	No
<u>Phase</u>	<u>FY</u>	<u>Federal</u>	<u>State</u>	<u>Other</u>	<u>Total</u>	<u>Funding Source(s)</u>		CAA Status:	N/A Illustrative
MTP	2035	\$8,285,546	\$2,071,387	\$0	\$10,356,933	STP, Toll Credit			
MTP	2036	\$18,170,202	\$4,542,550	\$0	\$22,712,752	STP, Toll Credit			
MTP	2037	\$18,751,649	\$4,687,912	\$0	\$23,439,560	STP, Toll Credit			
MTP	2038	\$22,766,707	\$5,691,676	\$0	\$28,458,383	STP, Toll Credit			
	MTP Total:	\$67,974,104	\$16,993,525	\$0	\$84,967,629				

**APPENDIX A
CONGESTION MANAGEMENT REPORT**



Congestion Management Report

NH 3A (LOWELL RD & RIVER RD), HUDSON



Segment Length: 4.73 miles

Daily Traffic Volumes: 7,000–31,000

Analysis Period: September 2016

Number of Traffic Signals: 10

Number of travel lanes: 2-4

Roadway Class: II (Minor Arterial) and IV (Principal Arterial— Other)

NH 3A serves as the major north-south thoroughfare in the Nashua Region east of the Merrimack River. The portion of the NH 3A corridor in Hudson comprises Lowell Rd and River Rd, which serves several local and region transportation functions. Its location on the state border encourages shoppers to enjoy New Hampshire's sales tax-free environment.

The route also parallels U.S. Route 3 at this juncture and the Merrimack River, thereby connecting Litchfield with Tyngsborough, Massachusetts. It is an alternative commuting route for those working within southern New Hampshire and metropolitan Boston area. It is also an important road for freight transportation and local attractions, including the Walmart, various shopping plazas, Hudson Center.

Due to its role as a commercial corridor, Lowell Rd is expected to have some degree of congestion during peak travel times. In addition to the high volume of cars at certain

peak travel times, contributors to this congestion are segments where travel lanes vary from two to four lanes in either direction, and short distances between traffic lights. Along certain segments, there is also a high density of curb cuts, which contribute to congestion.

Additionally, the southern portion of Lowell Road is a key access point to the Sagamore Bridge, which links Hudson with Nashua via one of the Merrimack River crossings in the Region. The Taylor Falls Bridge, which is further north, is the other Merrimack River crossing in the Nashua Region. This bridge crossing also intersects with NH 3A.

Along the route, there is minimal infrastructure for pedestrians and cyclists. Some segments of sidewalks exist near the commercial uses, such as Walmart, and nearby grocery stores.

Report, travel time runs and data analysis conducted by



NRPC

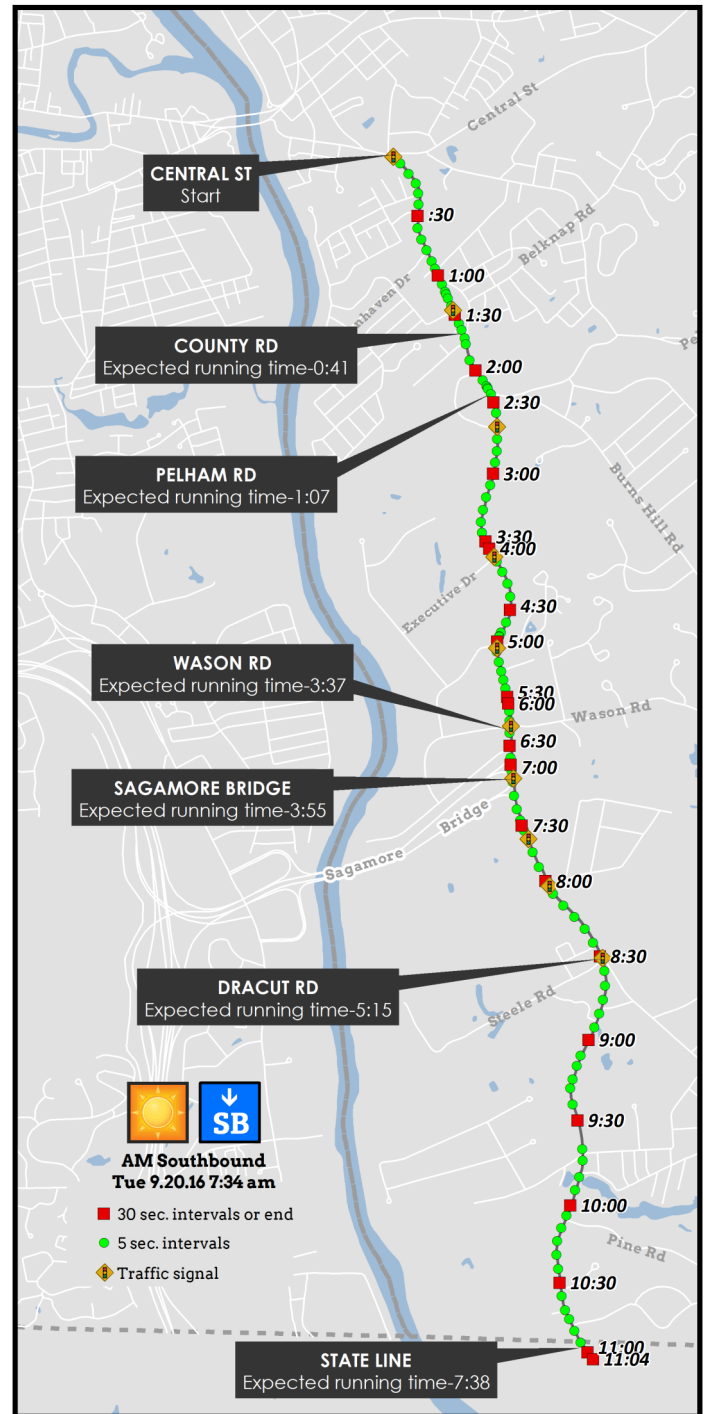
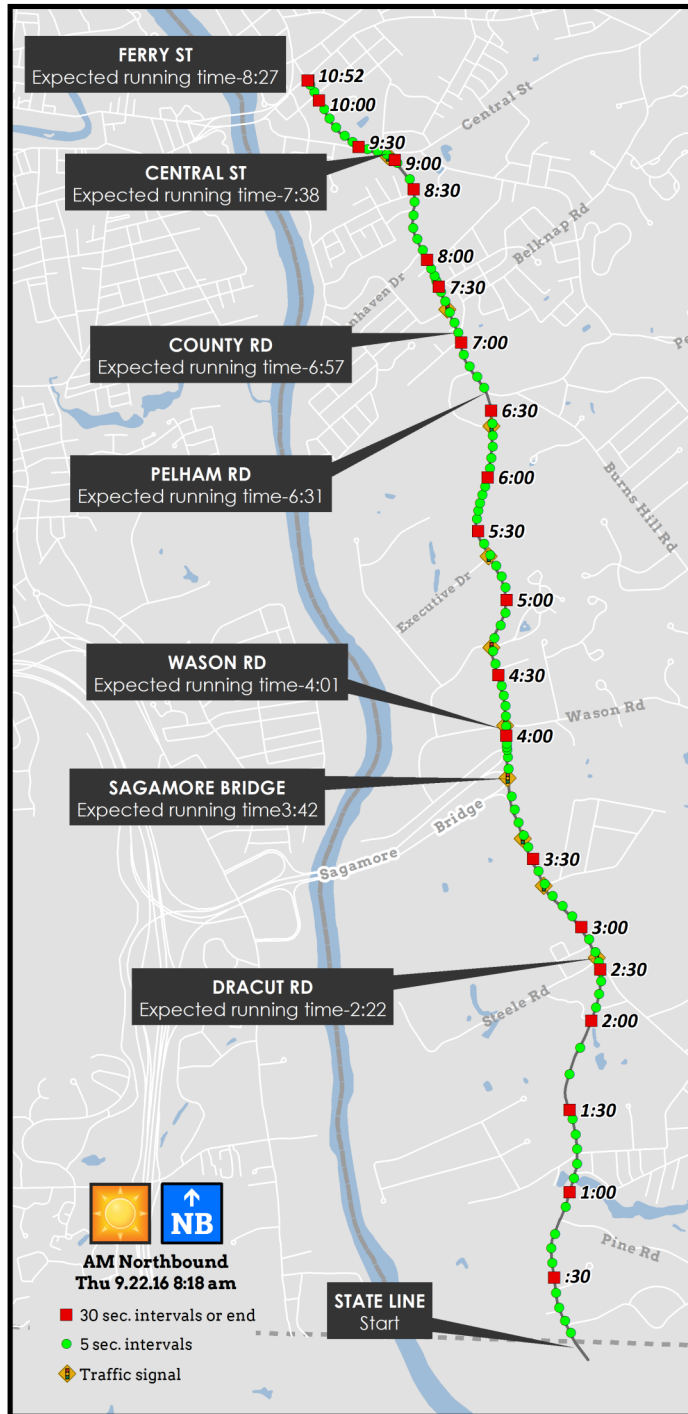
Nashua Regional
Planning Commission
2018

Value Yesterday. Enhance Tomorrow. Plan Today. and Avoid Congestion



AM Peak Period Actual & Expected Travel Times

Corridor Extents: Northbound: Ferry St to Massachusetts State Line. Southbound: Central St to Massachusetts State Line



Expected Travel Time during the Morning Commute

8 minutes and 27 seconds, traveling in *northerly* direction based upon posted speeds and free flowing traffic

7 minutes and 38 seconds, traveling in *southerly* direction based upon posted speeds and free flowing traffic

Actual Travel Time during the Morning Commute:*

Northbound

10 minutes and 52 seconds

2 minutes and 25 seconds (29%) longer than expected

Southbound

11 minutes and 04 seconds

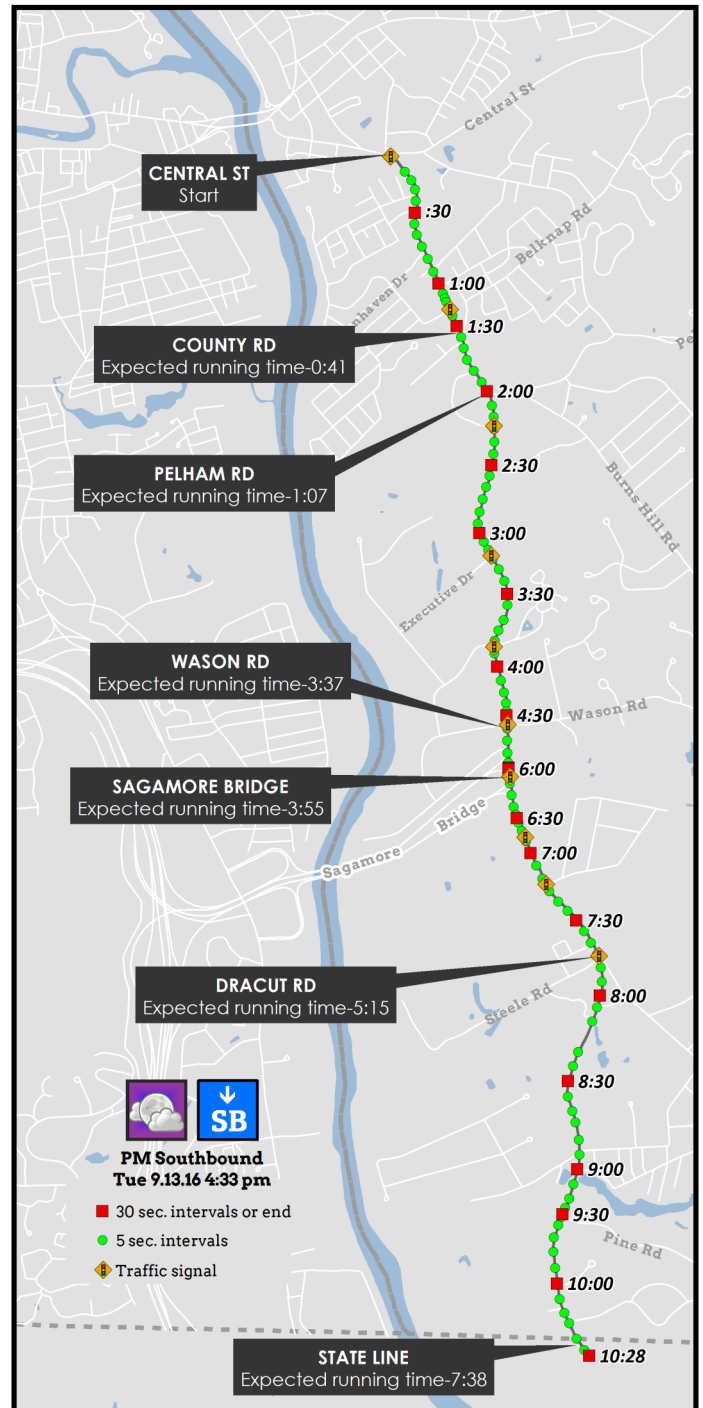
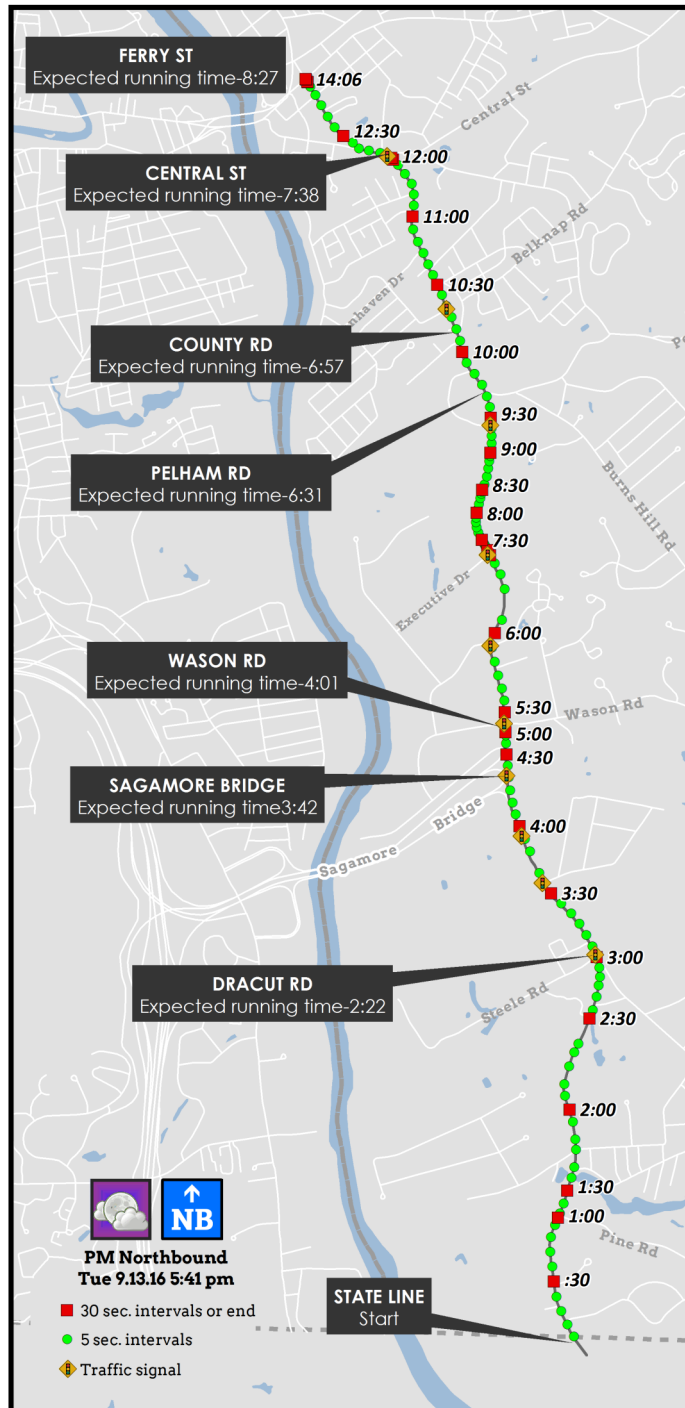
3 minutes and 26 seconds (45%) longer than expected

*The actual travel time is based upon a single travel run that was similar in duration and congestion to the average observed travel time.



PM Peak Period Actual & Expected Travel Times

Corridor Extents: Northbound: Massachusetts State Line to Ferry St. Southbound: Central St to Massachusetts State Line



Expected Travel Time during the Evening Commute

8 minutes and 27 seconds, traveling in *northerly* direction based upon posted speeds and free flowing traffic
7 minutes and 38 seconds, traveling in *southerly* direction based upon posted speeds and free flowing traffic

Actual Travel Time during the Evening Commute:*

Northbound	Southbound
14 minutes and 06 seconds	10 minutes and 28 seconds
5 minutes and 39 seconds (69%) longer than expected	2 minutes and 50 seconds (37%) longer than expected

*The actual travel time is based upon a single travel run that was similar in duration and congestion to the average observed travel time.



AM Travel Time Ratios (7:00am–9:00am)

Corridor Extents: Northbound: Massachusetts State Line to Ferry St. Southbound: Central St to Massachusetts State Line



Travel Time Ratio

A travel time ratio (TTR) compares the actual (measured) & expected (non-congested) travel times along a corridor. It is assumed that in non-congested conditions, motorists can travel at the posted speed limit. The actual time is the average of several travel time runs. The ratio between the actual time and the expected time would equal 1 for a non-congested segment.

Southbound

Congestion occurs during the morning peak period along several segments north of the Sagamore Bridge with ratios above the 1.5 threshold. Congestion does not occur south of the Sagamore Bridge.

On average, travel between Central St and Massachusetts State Line in the southbound direction during the morning commute takes approximately 2 minutes and 52 seconds (37%) longer as compared to free-flow conditions.

Northbound

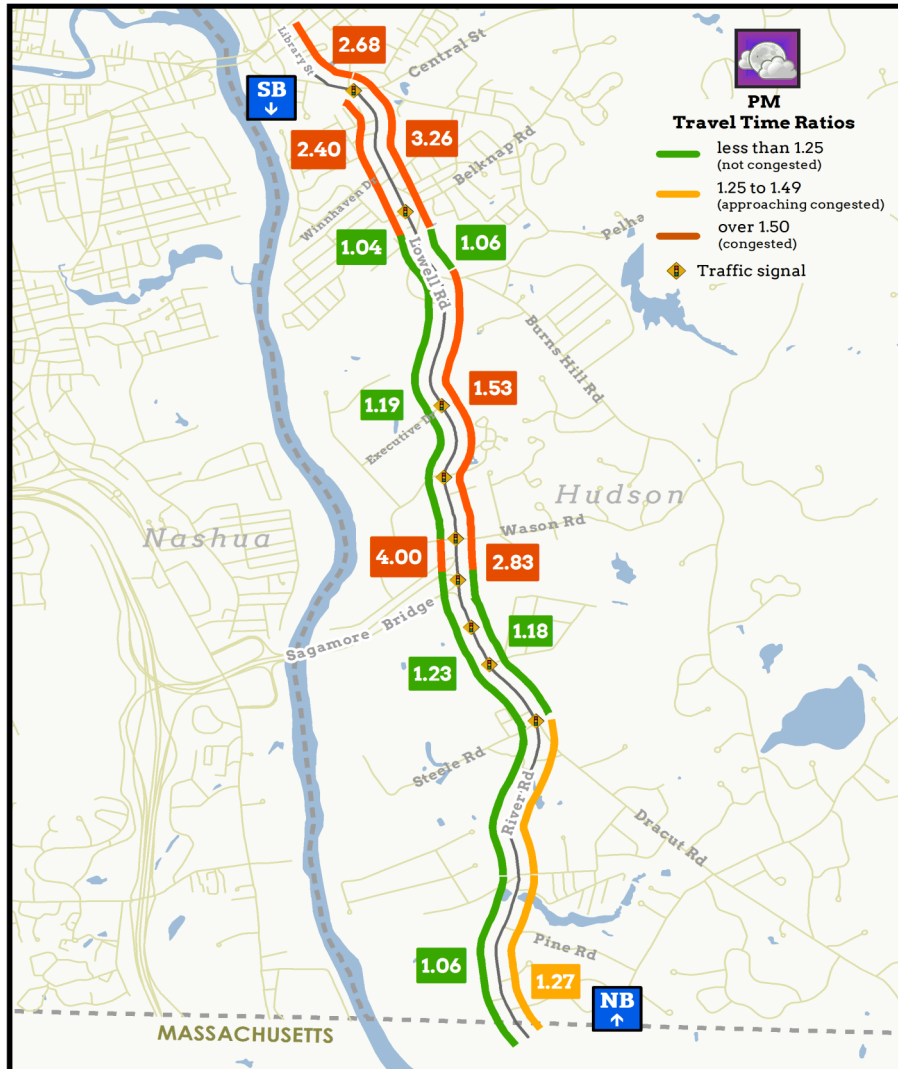
Congestion does occur in the northbound direction between Central St and County Rd and between Wason Rd and the Sagamore Bridge, as indicated by ratios that are above the threshold of 1.5. However, congestion does not occur for most of the segments.

NORTHBOUND	Length (miles)	Average Observed Travel Time (mm:ss)	Expected Travel Time (mm:ss)	Additional Travel Time (mm:ss)	Travel Time Ratio >1.5 = congestion
Massachusetts S/L to Dracut Rd	1.6	02:50	02:22	00:28	1.20
Dracut Rd to Sagamore Bridge	0.8	01:15	01:20	-00:05	0.93
Sagamore Bridge to Wason Rd	0.2	00:48	00:18	00:30	2.69
Wason Rd to Pelham Rd	1.3	02:26	02:30	-00:04	0.98
Pelham Rd to County Rd	0.2	00:27	00:26	00:00	1.00
County Rd to Central St	0.3	01:54	00:41	01:13	2.78
Central St to Ferry St	0.4	01:30	00:49	00:41	1.83
Total	4.73	11:10	08:27	02:44	
SOUTHBOUND	Length (miles)	Average Observed Travel Time (mm:ss)	Expected Travel Time (mm:ss)	Additional Travel Time (mm:ss)	Travel Time Ratio >1.5 = congestion
Central St to County Rd	0.3	01:44	00:41	01:03	2.54
County Rd to Pelham Rd	0.2	00:32	00:26	00:06	1.23
Pelham Rd to Wason Rd	1.3	03:21	02:30	00:51	1.34
Wason Rd to Sagamore Bridge	0.2	00:50	00:18	00:32	2.81
Sagamore Bridge to Dracut Rd	0.8	01:26	01:20	00:06	1.07
Dracut Rd to Massachusetts S/L	1.6	02:36	02:22	00:14	1.10
Total	4.32	10:29	07:38	02:52	



PM Travel Time Ratios (4:00pm–6:00pm)

Corridor Extents: Northbound: Ferry St to Massachusetts State Line. Southbound: Central St to Massachusetts State Line



Travel Time Ratio

A travel time ratio (TTR) compares the actual (measured) & expected (non-congested) travel times along a corridor. It is assumed that in non-congested conditions, motorists can travel at the posted speed limit. The actual time is the average of several travel time runs. The ratio between the actual time and the expected time would equal 1 for a non-congested segment.

Southbound

Congestion does occur in the southbound direction in the segments between the Central St to County Rd and Wason Rd to Sagamore Bridge during the evening peak period, as indicated by ratios that are above the threshold of 1.5.

Northbound

Congestion occurs during the evening peak period in the northbound direction in the segments north of the Sagamore Bridge (except for Pelham Rd to County Rd segment). Travel between the State Line and Dracut Rd approaches congested conditions.

On average, travel between the Massachusetts State and Ferry St in the northbound direction during the evening commute takes approximately 5:42 seconds (67%) longer as compared to free-flow conditions.

NORTHBOUND	Length (miles)	Average Observed Travel Time (mm:ss)	Expected Travel Time (mm:ss)	Additional Travel Time (mm:ss)	Travel Time Ratio >1.5 = congestion
Massachusetts S/L to Dracut Rd	1.6	03:01	02:22	00:39	1.27
Dracut Rd to Sagamore Bridge	0.8	01:34	01:20	00:14	1.18
Sagamore Bridge to Wason Rd	0.2	00:51	00:18	00:33	2.83
Wason Rd to Pelham Rd	1.3	03:50	02:30	01:20	1.53
Pelham Rd to County Rd	0.2	00:28	00:26	00:01	1.06
County Rd to Central St	0.3	02:13	00:41	01:32	3.26
Central St to Ferry St	0.4	02:12	00:49	01:23	2.68
	4.73	14:09	08:27	05:42	
SOUTHBOUND	Length (miles)	Average Observed Travel Time (mm:ss)	Expected Travel Time (mm:ss)	Additional Travel Time (mm:ss)	Travel Time Ratio >1.5 = congestion
Central St to County Rd	0.3	01:38	00:41	00:57	2.40
County Rd to Pelham Rd	0.2	00:28	00:26	00:01	1.04
Pelham Rd to Wason Rd	1.3	02:59	02:30	00:29	1.19
Wason Rd to Sagamore Bridge	0.2	01:12	00:18	00:54	4.00
Sagamore Bridge to Dracut Rd	0.8	01:39	01:20	00:19	1.23
Dracut Rd to Massachusetts S/L	1.6	02:30	02:22	00:08	1.06
	4.32	10:25	07:38	02:47	



Probe Travel Time Data

Corridor Extents: Northbound: Sagamore Bridge to Derry St. Southbound: Derry St to Sagamore Bridge

The NPMRDS provides roadway performance data for the National Highway System (NHS). The NPMRDS data are derived from instantaneous vehicle probe speed data supplied by a variety of GPS devices carried by both trucks and cars. The data are supplied on a GIS roadway network, which divides the NHS into directional road segments based on the Traffic Message Channel (TMC) standard.

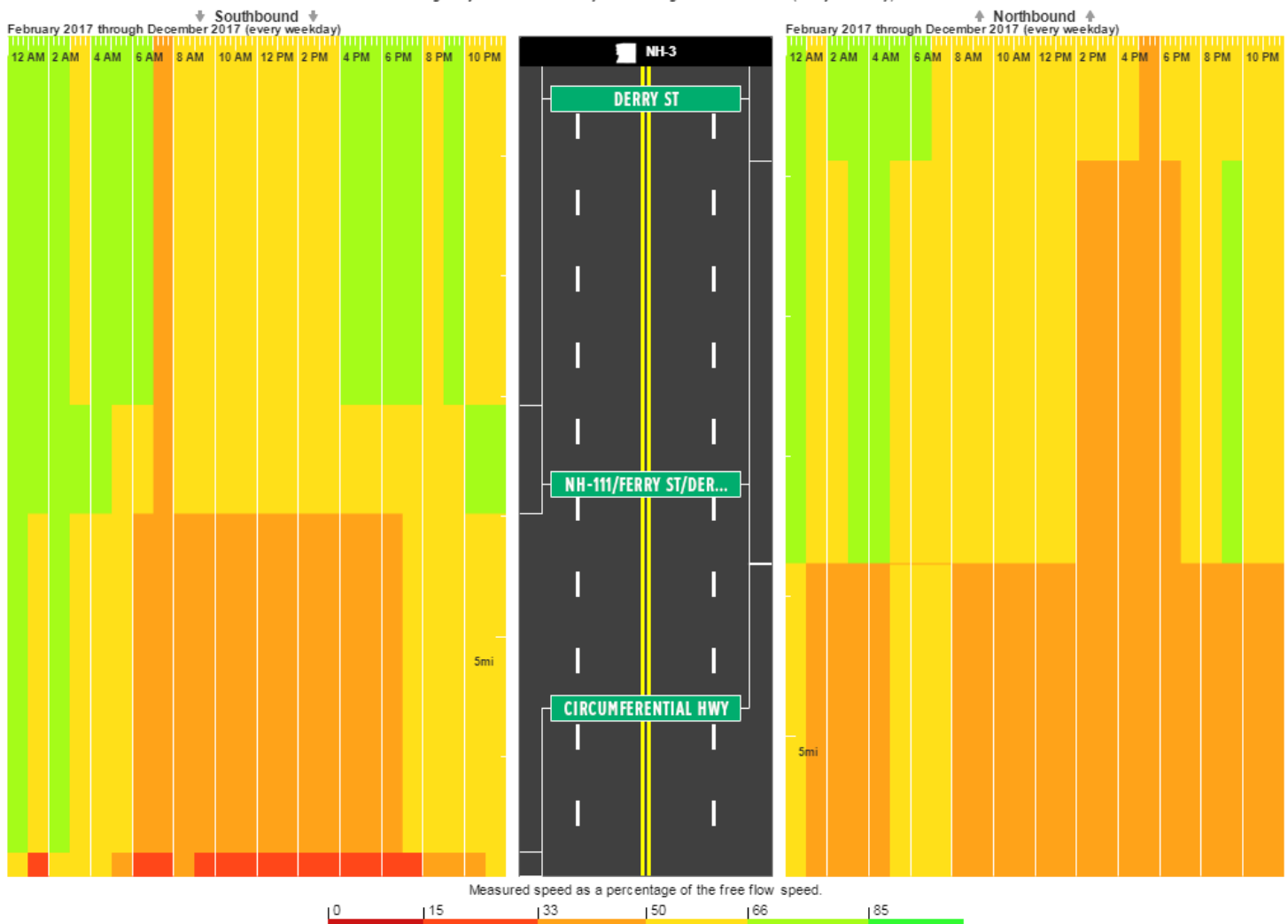
Travel times from the National Performance Measurement Research Data Set (NPMRDS) are available for the extent of NH 3A between Derry St (NH 102) and the Circumferential Highway (Sagamore Bridge). Weekday travel time data collected in 2017 along three TMCs located as shown in the figure below is summarized by measured speed as a percentage of free flow speed.

The percent of traffic traveling below the speed limit versus at or above the posted speed limit during the peak and off peak hours for each segment is graphed in figures below. The segments are arranged

by the time of day shown horizontally and the location along NH 3A shown vertically. Southbound traffic is on the left, while northbound traffic is shown on the right. Segments are colored based on a scale from red to orange to green, which corresponds to transition from higher levels of congestion to lower levels of congestion.

The data indicate that, in general, that Southbound AM and PM peak near the Circumferential Highway is most congested, with greater than 66% of travel speeds below the speed limit for both passenger and

Congestion on NH-3A between Circumferential Hwy and Derry St using NPMRDS (Trucks and passenger vehicles) data
Averaged by 1 hour for February 2017 through December 2017 (every weekday)





Probe Travel Time Data

Corridor Extents: Northbound: Sagamore Bridge to Derry St. Southbound: Derry St to Sagamore Bridge

The 2017 weekday travel time data was also summarized by average travel speed by hour of day for all vehicle types (passenger and freight combined), as shown in the figure below.

Northbound traffic slows considerably during the PM peak hours between Derry St and the Sagamore Bridge, where there is a high volume of commuter traffic in from Massachusetts.

A similar slow down occurs in the same area in the southbound direction during the AM and PM

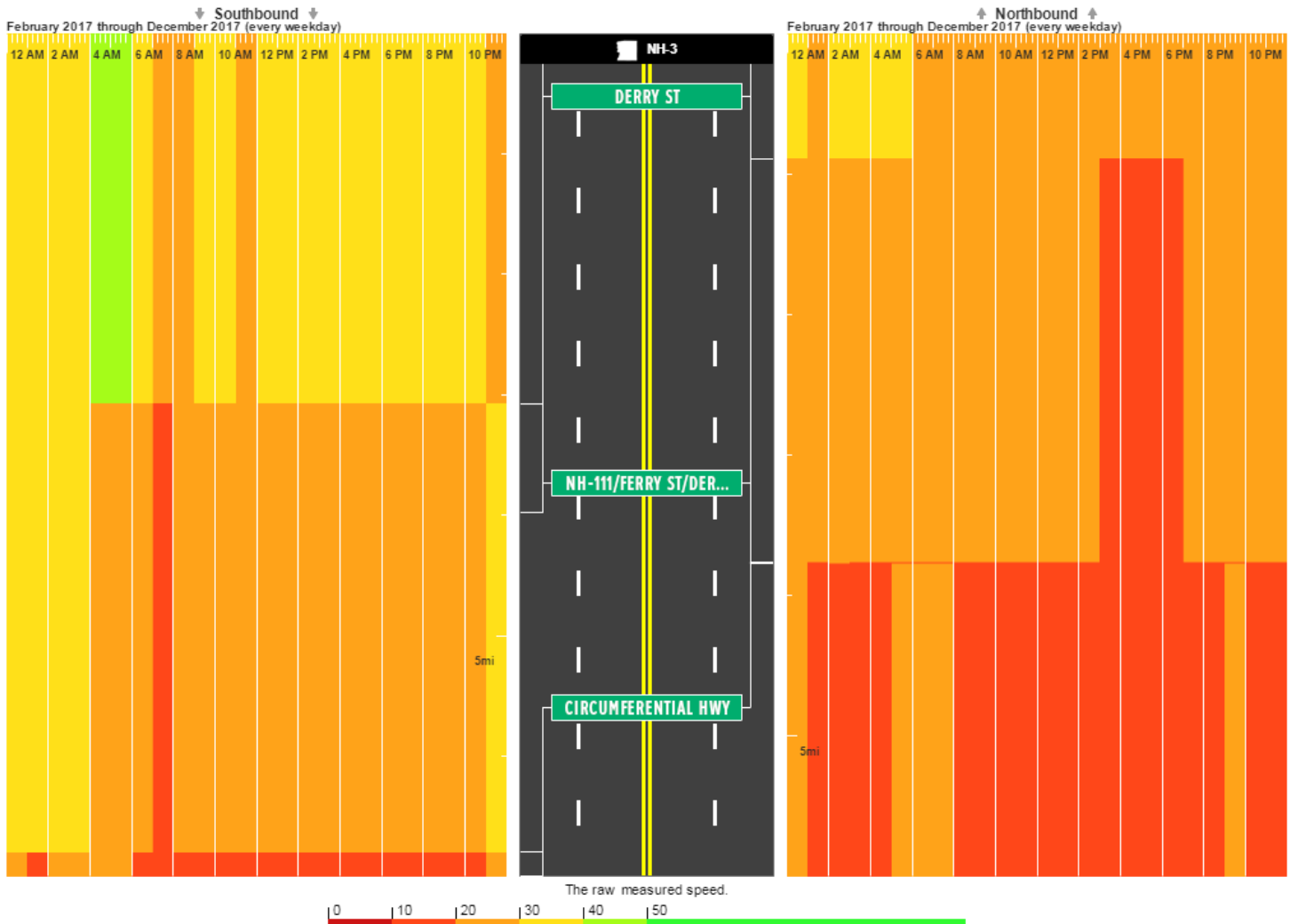
peak, though it is confined to a much shorter segment of NH 3A. The slow speeds in the north- and southbound directions occurs where traffic from the Sagamore Bridge merges with already existing traffic on NH 3A.

The variations in speeds on the chart below represent the changes in posted speed limit at different points along NH 3A. These fluctuations represent the different character and purposes of NH 3A within the Town of Hudson.



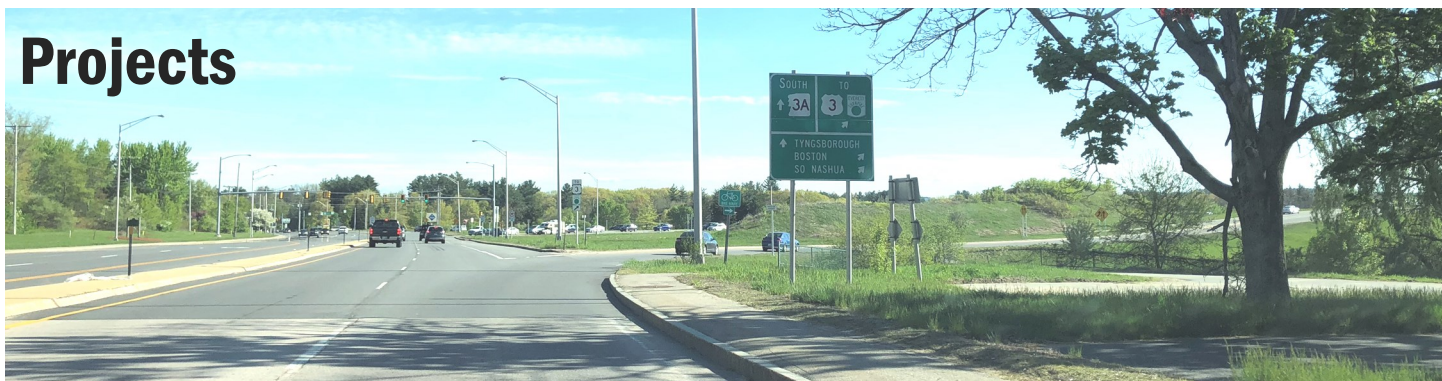
Speed on NH-3A between Circumferential Hwy and Derry St using NPMRDS (Trucks and passenger vehicles) data

Averaged by 1 hour for February 2017 through December 2017 (every weekday)





Projects



There are several infrastructure projects along the NH 3A that could impact the corridor. One major cause for congestion is the population growth Hudson has experienced over the past few decades. The completion of the Circumferential Highway was first proposed in the late 1950's to provide additional crossings of the Merrimack River and mitigate congestion in downtown Hudson and downtown Nashua. The Sagamore Bridge crossing south of downtown Nashua was expanded and forms the only portion of the Circumferential Highway that has been constructed to date. The Town of Hudson is considering funding options for some of the projects that could alleviate congestion impacts.

The Nashua Regional Planning Commission plans to complete an additional congestion analysis of NH 3A after the impacts of the nearby improvements are fully in effect.

Existing projects on NH 3A (Lowell Rd and River Rd), Hudson					
Project	Funding Years	Estimate [^]	Scope	Benefits (CMP Strategy*)	Status
Northern Crossing	2033 - 2040	\$267,283,896	Construct a northern crossing of the Merrimack River to provide a four lane roadway connecting NH 102 in Hudson, NH 3A in Litchfield and US 3 in Nashua; exact location of crossing to be determined	Improved accessibility & mobility, including freight mobility; reduced congestion and auto emissions (6e)	MPO Long Range Project (Not in TYP)
NH 3A/Lowell Road Improvements	2021	\$479,584	Continue Sidewalk on NH 3A/Lowell Rd from Birch St to Executive Dr	Increase mobility and access; Increase nonmotorized mode shares; Separate slow moving bicycles from motorized vehicles; Reduce incidents (3a)	MPO Long Range Project (Not in TYP)
NH 3A/Lowell Road Intersection Improvements	2021	\$712,525	Add a right turn lane on NH 3A/Lowell Rd southbound from Flagstone Drive to the westbound ramp on Sagamore Bridge Rd	Increase mobility; Reduce congestion by improving bottlenecks; Increase traffic flow and improve safety (1b)	MPO Long Range Project (Not in TYP)
Nearby projects with potential impacts to NH 3A (Lowell Rd and River Rd), Hudson					
Project	Funding Years	Estimate [^]	Scope	Benefits (CMP Strategy*)	Status
NH 102/Derry Road Improvements - Phase II & Phase III	2021	\$896,137	Phase II: Continue Pedestrian/Bike Lane on Derry Rd/NH 102, from Towhee Dr to the Hudson Mall	Increase mobility and access; Increase nonmotorized mode shares; Separate slow moving bicycles from motorized vehicles; Reduce incidents (3a)	MPO Long Range Project (Not in TYP)
East Hollis Street Improvements - 1	2017 - 2018	\$4,170,111	Intersection improvements at the intersection of East Hollis Street and Bridge Street from C Street to the Hudson Town Line	Improve safety for all users, including bicyclists and pedestrians; improve traffic flow and mobility (3d)	Existing 2017 - 2020 TIP project
East Hollis Street Improvements - 2	2022 - 2025	\$5,111,042	Improvements to East Hollis Street and its intersections	Improved safety for all users, including bicyclists and pedestrians; improved traffic flow and mobility (3d)	Existing 2017 - 2026 TYP Project
Park 'n Ride	1999 - 2017	\$3,596,087	Construct Crown Street Park 'n Ride and accessory facilities	Support carpool, vanpool, intercity bus and alternate modes of transportation (2c)	Existing 2017 - 2020 TIP project
Capitol Corridor	2020+	\$125,000,000 - \$250,000,000	Establish passenger rail in New Hampshire. Lower estimate reflects Nashua option; higher estimate reflects Manchester option.	Reduced trip times, alternative mode option, improved access, economic development, reduced auto emissions	MPO Long Range Project (Illustrative)

[^]Estimate costs include indirects and inflation

*Strategy definitions are detailed in the NRPC MPO Congestion Management Process Toolbox: http://www.nashuarpc.org/files/4613/8981/7207/NRPC_CongMgmtProc_2010.pdf

**APPENDIX B
METROPOLITAN TRANSPORTATION PLAN PUBLIC
NOTICES**

APPENDIX B

METROPOLITAN TRANSPORTATION PLAN PUBLIC NOTICES

NASHUA REGIONAL PLANNING COMMISSION NOTICE OF INTENT TO UPDATE THE METROPOLITAN TRANSPORTATION PLAN

The Nashua Regional Planning Commission announces its intent to update the Metropolitan Transportation Plan (MTP) for the Nashua Metropolitan Planning Organization (MPO) area. The current MTP identifies and assesses transportation needs for the 13-municipality Nashua MPO region over a 25-year planning horizon (2015-2040). Copies of the existing MTP and related documents are on file at the office of NRPC and on the NRPC website (www.nashuarpc.org).

The MTP update will assess needs related to all modes of surface transportation in the region including driving, bicycling, walking, rail and bus transit, and rail and truck freight for the period covering 2019 – 2045.

Opportunities for public participation and input to identify priority issues and concerns will be announced on the Nashua Regional Planning Commission website and through local media as details are finalized.

For further information please contact: Gregg Lantos, Principal Transportation Planner, NRPC, 9 Executive Park Drive, Suite 201, Merrimack, NH 03054-2230, 603-424-2240 x19, greggl@nashuarpc.org.

Public Comment Period And Notice of Public Hearing

The NRPC Metropolitan Planning Organization is accepting public comment on the
2019 – 2045 Metropolitan Transportation Plan

The Nashua Regional Planning Commission (NRPC) is holding a public comment period for its draft 2019 – 2045 Metropolitan Transportation Plan (MTP). The MTP is a long-range planning document to guide the Nashua Metropolitan Area's transportation projects and programs over a 25-year period. Updated every four years to reflect changing conditions and new planning emphasis areas, the MTP update provides an analysis of existing conditions and future needs through estimates of population and employment growth, as well as priorities expressed by the general public. It provides a recommended fiscally-constrained program of projects to address future transportation needs and recommends other actions to reduce future travel demand. The MTP's emphasis is on maintenance of the existing infrastructure and support for alternative modes, including transit and pedestrian/bicycle travel.

A complete copy of this document is on file at the NRPC office and on the NRPC website www.nashuarpc.org. Comments will be accepted through December 19, 2018. A Public Hearing will be held on Wednesday, December 19, 2018 at 7:00 PM at the NRPC office, located at 9 Executive Park Drive, Suite 201, Merrimack, NH.

For further information or if you have comments on the plan please contact: Gregg Lantos, Principal Transportation Planner, NRPC, 9 Executive Park Drive, Suite 201, Merrimack, NH 03054-2230, 603-424-2240 x19, greggl@nashuarpc.org.