

## 1. STUDY GOAL

The goal of the Plaistow Commuter Rail Extension Study is to evaluate the extension of the MBTA Haverhill Line commuter rail service from Haverhill, MA to Plaistow, NH, identifying both the potential benefits and impacts of the service.

The objective of the study is to develop information and analysis that can form the basis of an informed decision making process regarding whether or not to advance the project. The study will include an evaluation of the following:

- Potential sites for MBTA commuter rail station
- Potential sites for MBTA commuter rail layover facility
- Design and engineering options for the commuter rail station and layover facility
- Review of environmental impacts of station and layover facility, including (but not limited to):
  - Natural Environment
  - Historic and Cultural Resources
  - Land Use
  - Noise and Vibration
  - Air Quality
- Ridership Forecasts
- Capital Cost Estimates
- Operating Cost Estimates
- Funding and Implementation Options

## 2. PROJECT PURPOSE AND NEED STATEMENT

The following sections include the Purpose and Need statement for the Plaistow Commuter Rail Extension *project*, this differs from the goals of the *study* which are identified above. The Purpose and Need statement is an essential part of the environmental process and an important component of project planning. A Purpose and Need statement required of any project that will be reviewed under the National Environmental Policy Act (NEPA). This act requires all federal agencies to consider the impacts of their actions on the environment.<sup>1</sup>

The project “purpose” is an objective that the proposed project is intended to meet. The “need” establishes the evidence that a potential problem exists. In other words, it explains why the project is being proposed and why it should be considered. In addition to establishing the underlying rationale for considering a project, the purpose and need statement helps provide context and criteria for developing the range of possible alternatives, and eventually the selection of a preferred alternative.

In addition to identifying the purpose and associated needs of a potential project, it is important to note that the Purpose and Need statement has a definite and important function in the NEPA process. The NEPA process defines how potential alternatives are developed and screened for consideration. Specifically, a critical screening criterion is whether an alternative meets the project Purpose and Need statement. Alternatives that do not meet the Purpose and Need statement must be screened out. Thus, the Purpose and Need sets the boundaries of what can and can not be considered viable alternatives under the NEPA process.

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<sup>1</sup> It is assumed that if the Plaistow Commuter Rail Extension is implemented part of the capital funding would likely come from the Federal Transit Administration (FTA), and therefore funding would constitute an action by FTA.

### 3. PURPOSE

The purpose of the commuter rail extension from Haverhill, Massachusetts to Plaistow, New Hampshire is to provide an additional travel mode option that increases overall mobility in Plaistow and surrounding communities.

### 4. NEED

Travel mode options for Plaistow and surrounding communities are needed to improve mobility and access to employment for residents and businesses in the Plaistow area, while increasing opportunities for economic development. Specific needs that could be addressed through improved travel mode options include:

- Reducing impacts of roadway congestion on average commute travel times;
- Reducing commuting costs and travel times, particularly for commuters to the primary regional employment center of Boston, Massachusetts;
- Serving future changes in travel preferences;
- Increasing access to employment opportunities;
- Improving regional air quality; and
- Supporting economic development and job creation.

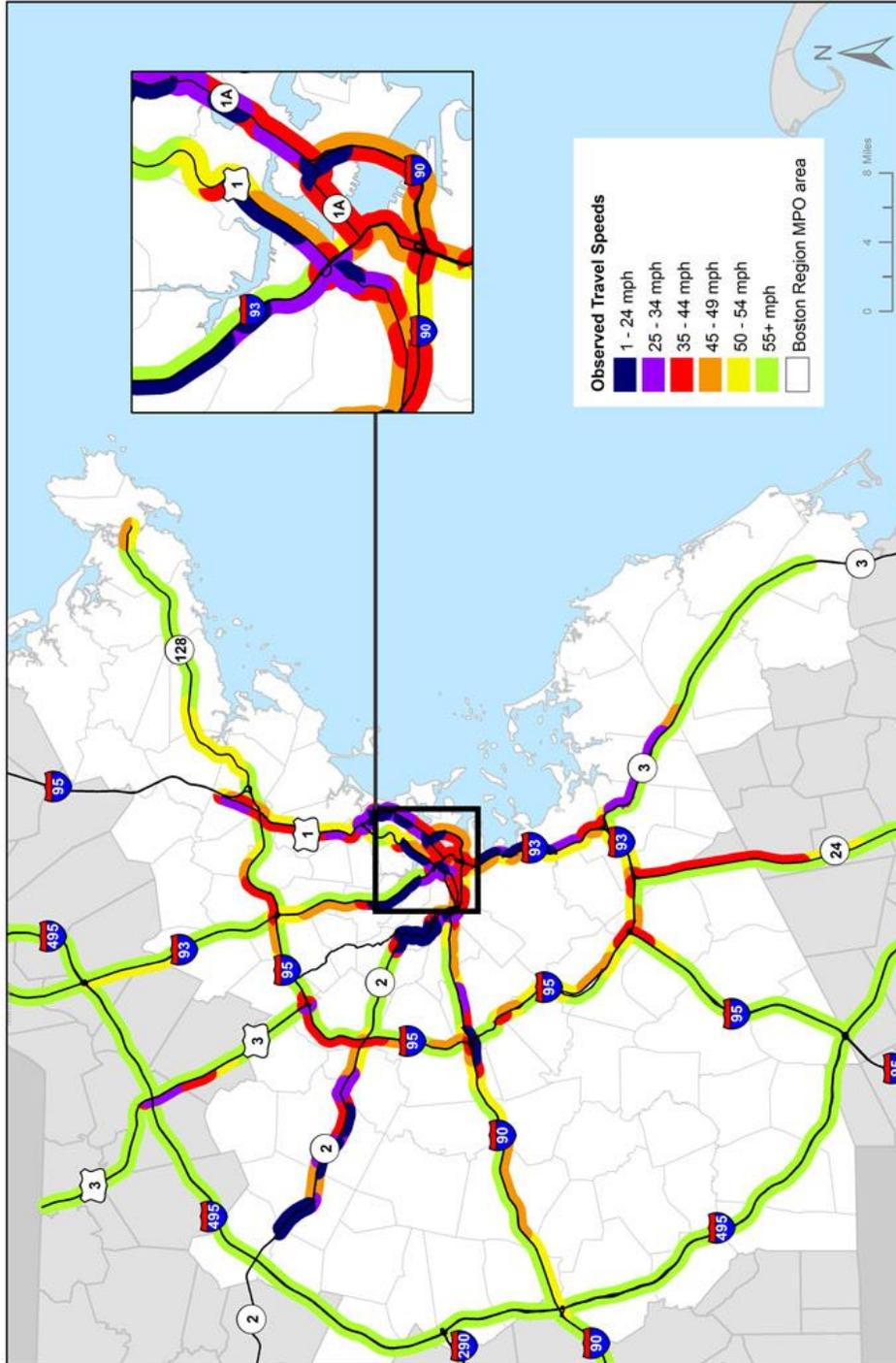
#### 4.1 Roadway Congestion and Mobility

Highway access in the region is provided through Interstates 93, 95, and 495, US Route 3, and a variety of other local and state roads, including Route 125. Interstates in metropolitan Boston and southern New Hampshire have peak-period congestion and capacity issues. I-93 in Massachusetts, in particular, has unstable traffic flow that is at or beyond capacity in key areas, making it among the most congested routes in the nation.<sup>2</sup> The automobile commute from Plaistow to downtown Boston typically takes in excess of 100 minutes during peak hours, more than 2.5 times a non-congested journey.<sup>3</sup> Due to environmental concerns, cost, and community impacts, it is becoming increasingly unlikely that significant roadway capacity will be added in the region in the foreseeable future, particularly in eastern Massachusetts. Therefore, congestion relief in the region will necessarily have to result from non-highway improvements. Figure 1.1 illustrates typical AM peak period traffic conditions for expressways in eastern Massachusetts.

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<sup>2</sup> "Congested Corridors (U.S. Only for 2012). INRIX Traffic Scorecard, <http://www.inrix.com/scorecard/uscorridors.asp>, accessed November 11, 2013

<sup>3</sup> [www.maps.google.com](http://www.maps.google.com), observed in December 2013 and January 2014.



**Figure 1.1 Travel Speeds for Expressways  
 (AM Peak Period 2004-2007)**

Source: Boston Region MPO, Congestion Management Process

Based on data collected by the Boston Region MPO, roadways in Eastern Massachusetts experienced a decline in usage due to economic conditions from 2007-2010; however, traffic has recovered to pre-recession levels.

Greater Boston has a diverse transportation network, with extensive transit and road connections between major population and employment centers. The predominant mode of travel in the region is by single occupant vehicle. Roadways in eastern Massachusetts and southern New Hampshire experience severe peak-hour congestion, causing delays and restricting mobility throughout the region. As a means to avoid congestion and high parking prices, many commuters in the region often opt for transit where available, evidenced by the Boston metropolitan area having one of the nations highest transit mode shares of over 12 percent. This regional level of transit utilization is consistent with transit usage observed between New Hampshire and the Boston “inner core” area, a travel pattern for which 11 percent of commuters use transit. Providing alternative modes for New Hampshire travelers could reduce the reliance on congested highways for transportation.

## 4.2 Commuting Costs and Travel Times

Travel options from Plaistow and surrounding towns in southern New Hampshire to major employment centers to the south often involve significant delays or long trip times during weekday peak periods. Table 1.1 provides a sample of travel costs and scheduled journey times for travel options (MBTS Commuter Rail, Amtrak, Coach Bus, MBTA Orange Line) between Plaistow and Boston-North Station during peak periods. The passenger car routes utilized as part of the estimates represent are the most direct routes specified by the directions function within the Google Maps web application. The routes selected were from Plaistow town hall to the identified destination. Alternative routes were explored and found to have no time savings or longer travel times.

Until recently, Coach Company provided bus service to Plaistow’s Park and Ride lot located on Westville Road. The bus service took a circuitous route through Newburyport, MA to reach Boston. As of October 1, 2013, the company suspended operations to the Plaistow Park and Ride. The bus originally operated directly from Plaistow to Boston, but due to low ridership, presumably a result of long travel times along congested roadways, modifications were made that eventually led to the suspension of service.

Currently, for express bus service to Boston, residents must drive to the Boston Express service at Salem, NH, or to the Coach Bus service at Haverhill, MA. Although the bus service is frequent, offering between two and 19 round trips to Boston per day, buses are subject to many of the same delays automobiles on the region’s congested roadways for access to Boston.

Currently, the Merrimack Valley Regional Transit Authority (MVRTA) Number 13 bus connects Plaistow to rail transit and express bus service in downtown Haverhill, MA. However, MVRTA buses and other schedules are not always coordinated, leaving passengers with unpredictable transfer times and waits. Also, MVRTA buses only operate to Plaistow’s southern border, leaving most residents with long walks, cab rides, or other means of reaching the public transit.

MBTA and Amtrak rail service is provided in downtown Haverhill, MA. A large park and ride lot is located next to the station, charging \$4.00 per day. Amtrak and MBTA service from Haverhill Station operates frequently and a journey to Boston takes 50 to 71 minutes; the disparity in rail times reflects the impact of express and local service and other schedule service adjustments. Additionally, commuters can opt for rapid transit service by driving to Malden (Malden Center Station), MA for the MBTA’s Orange Line into downtown Boston. All options are significantly more cost effective than driving and paying for garage parking in downtown Boston; however, reaching each mode requires a connecting bus journey or car ride, causing delays and inconvenience for travelers, particularly during rush hour.

Driving to downtown Boston from Plaistow, NH during peak hours can regularly take over 100 minutes. In downtown Boston, parking fees are among the highest in the nation, with garages in the vicinity of North Station charging \$35 for daily rates.

**Table 1.1 Travel Time and Cost on Existing Transit Systems - Plaistow to Boston (North Station)**

Mode	Parking/ Connection Cost	Fare <sup>1</sup>	Driving Cost <sup>2</sup>	Total	Sample Journey (Minutes) <sup>3</sup>
MBTA Haverhill Line Commuter Rail (access via local bus)	\$1.00	\$9.25	\$0.00	<b>\$10.25</b>	<b>126</b>
MBTA Haverhill Line Commuter Rail (access via passenger car) <sup>4</sup>	\$4.00	\$9.25	\$2.94	<b>\$16.19</b>	<b>68-83</b>
Amtrak Downeaster Service (access via passenger car) <sup>4</sup>	\$4.00	\$13.00	\$2.94	<b>\$19.94</b>	<b>62</b>
Coach Bus Service (access via passenger car to Haverhill River Edge Plaza) <sup>5</sup>	\$0.00	\$13.00	\$3.84	<b>\$16.84</b>	<b>105</b>
MBTA Orange Line (access via passenger car to Malden Center Station)	\$6.00	\$2.00	\$19.89	<b>\$27.89</b>	<b>52 (85+ in traffic)</b>

Source: MBTA, Amtrak, and Coach Company, accessed November 18, 2013

1. Fare reductions are possible with purchase of a monthly or 10-trip pass.
2. All driving costs are calculated from Plaistow Town Hall using Federal Highway Administration Driving Cost Per-Mile Data 2013, which includes average cost of gas and vehicle depreciation. Vehicle mileage per trip is based on output from Google Maps Directions.
3. Sample journey times do not account for transfer, wait time, or traffic/regular delays.
4. Driving from Plaistow town center to Haverhill Station was assumed by Google Maps Directions to use Main Street and North Street in Plaistow and North Street to Main Street and Merrimack Street in Haverhill.
5. Closest Coach Company bus service access is at Haverhill River Edge Plaza.

### 4.3 Travel Preferences

The traveling public is increasingly favoring modes of transportation other than driving in a single occupant vehicle. Nationally, driving rates, calculated by population adjusted vehicle-miles traveled (VMT), peaked in June 2005 and has continued to decline since. While a decline in driving due to a recession and unemployment is expected, the decline began before the 2008-09 Recession and has continued despite modest recovery in the economy and employment rate. Figure 1.2 shows that VMT, adjusted for population growth, has fallen 8.75% since 2005 and shows no sign of abating.<sup>4</sup>

While per-capita driving has decreased, national transit ridership and ridership on the Haverhill line have grown. Nationally, transit ridership increased over 40% from 1995 to 2011, even as the nation’s population increased by only 17% during the same period.<sup>5</sup> Despite the 2007-09 Recession and the loss of employment in Boston’s Central Business District, the Haverhill Line’s average weekday ridership grew slightly from an average of 10,232 in 2005 to 11,045 daily boardings in 2009.<sup>6</sup>

<sup>4</sup> Data for chart is from the Federal Highway Administration’s collection and processing of state maintained traffic counters at 4,000 locations nationwide.

<sup>5</sup> “2013 Public Transportation Fact Book.” American Public Transportation Association. October 2013, Page 10. <http://www.apta.com/resources/statistics/Documents/FactBook/2013-APTA-Fact-Book.pdf>

<sup>6</sup> “Ridership and Service Statistics; Thirteenth Edition 2010.” Massachusetts Bay Transportation Authority, July 2010, Page 04-06. <http://www.mbta.com/uploadedfiles/documents/bluebook%202010.pdf>

Specifically, demographics in New Hampshire and Massachusetts are changing and key populations will increasingly drive less and rely on transit more. Importantly, the region’s senior population is growing and the Millennial generation, people born between 1982 and the early 2000s, drive significantly less than other cohorts of the population.

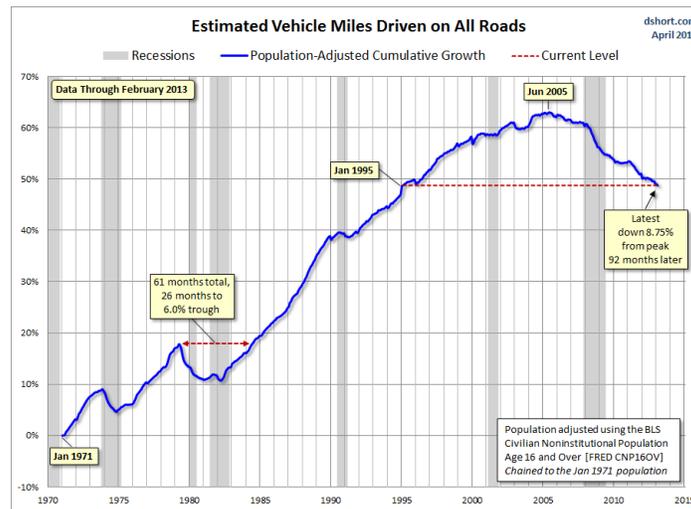


Figure 1.2. VMT Adjusted for Population Growth Since 1971<sup>7</sup>

By 2030, the Census Bureau projects that the population in New England states will see a dramatic change in the general age of the population with the percent over 65 rising significantly. While population aging is occurring across the country, the New England states are generally older than the U.S. average and aging more rapidly than the U.S. average. With this aging population comes a decrease in mobility and a higher reliance on public transportation.

As shown in Table 1.2, between 2000 and 2030, the population of individuals 65 years of age and over, population segment who tend to rely more on public transportation, in Massachusetts and New Hampshire is projected to increase by 80 percent during the 30 year period. Although most senior residents do not regularly commute for employment, the mobility provided by commuter rail service may be life changing for some senior residents.

Table 1.2. Population 65 Years of Age and Over

State	Total Population 65 Years of Age and Over (Percentage of Total Population)		Percent Increase Between 2000 and 2030
	2000	2030	
Massachusetts	860,162 (13.5)	1,463,110 (20.9)	70.1
New Hampshire	147,970 (12.0)	352,786 (21.4)	138.4
<b>Total</b>	<b>1,008,132</b>	<b>1,815,896</b>	<b>80%</b>

<sup>7</sup> Short, Doug. “Vehicle Miles Driven: Population-Adjusted Fractionally Off Its June Post-Crisis Low.” Advisor Perspectives, October 1, 2013, <http://advisorperspectives.com/dshort/updates/DOT-Miles-Driven.php>

Source: *Population Pyramids and Demographic Summary Indicators for States*, retrieved on Nov. 11, 2013, <http://www.census.gov/population/projections/data/statepyramid.html>

Additionally, the Millennial Generation, drives significantly less than previous generations. Between 2001 and 2009, VMT among 16-34 year olds declined 23 percent, public transportation use rose 40 percent, and bicycling rose 24 percent.<sup>8</sup> Trends were consistent among income groups, with even well off young Americans driving less and using alternative transportation more.<sup>9</sup> Reasons for the decline in driving among young Americans vary, but potential attributes include the increasing cost of driving, more young people living in transit oriented areas, the 2007-09 Recession, and the impact of technology.<sup>10</sup>

#### 4.4 Regional Air Quality Attainment

The eastern Massachusetts and southern New Hampshire regions are in moderate to serious nonattainment for Ozone and Carbon Monoxide levels, according to the United States Department of Transportation.<sup>11</sup> Ozone and Carbon Monoxide levels are significantly influenced by transportation patterns, particularly where commuting by single occupant vehicles is prevalent. Public transit options, particularly rail, have a proven track record of attracting commuters and having a positive impact on the regional air quality, by allowing commuters to shorten or eliminate vehicle trips. Public transit will facilitate existing and future commuters to drive less and contribute less to negative regional air quality. These transit air quality benefits will be increased even further as new locomotives are built or overhauled that meet the most recent emission standards, which require 80 to 90 percent reduction in some contaminants.

#### 4.5 Economic Opportunity

Transportation infrastructure has a significant impact on the economy of regions, with infrastructure facilitating job access and employer’s access to larger employee talent pools. Connectivity to job centers and specialized employment clusters is a key consideration for New Hampshire residents. Currently, residents must rely on expensive and congested auto-journeys or inconvenient transit services to reach the 445,000 jobs in the Boston “inner core” which includes Boston, Cambridge, and Somerville. This inconvenient access to the major regional jobs center places the Plaistow region in a disadvantageous position compared with peer areas in southern New Hampshire and eastern Massachusetts.

Access to jobs is especially important in New England, where unemployment rates vary considerably between metropolitan regions. Despite years of recovery after the 2007-2009 Recession, the unemployment rate remains high but varies across the region depending on city, town, and county. This is especially true in Plaistow, NH, where the unemployment rate is 7.1% (August 2013), two percent

<sup>8</sup> Davis , Benjamin; Dutzik, Tony; Baxandall, Phineas. “Transportation and the New Generation: Why Young People Are Driving Less and What It Means for Transportation Policy.” *The Frontier Group*, June 2012, <http://www.frontiergroup.org/reports/fg/transportation-and-new-generation>

<sup>9</sup> Ibid.

<sup>10</sup> Plumer, Brad. “Why aren’t younger Americans driving anymore?” *Washington Post*, April 22, 2013, <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/04/22/why-arent-younger-americans-driving-anymore/>

<sup>11</sup> “State Transportation Statistics.” Research and Innovative Technology Administration, United States Department of Transportation, [http://www.rita.dot.gov/bts/sites/rita.dot.gov/files/publications/state\\_transportation\\_statistics/index.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov/files/publications/state_transportation_statistics/index.html) accessed November 19, 2013.

above the New Hampshire state average.<sup>12</sup> Transportation improvements could help to lower unemployment rates by better connecting people to jobs available in other parts of the region.

The Boston inner core contains approximately 445,000 jobs.<sup>13</sup> These jobs are easily accessed via commuter rail and MBTA rapid transit; however, due to high parking costs and roadway congestion, jobs in the regional core are not easily accessible by private automobile. Creating a direct connection to the Boston inner core job market could provide Plaistow area residents with vastly increased employment opportunities. Currently, Plaistow residents have relatively easy access to jobs in New Hampshire (645,400 in total) and the northern Interstate 495 belt (252,000 in total) via private automobile; providing a direct transit connection to the Boston regional core will increase Plaistow resident's easy access an important employment job center by providing an improved travel mode option.

#### **4.6 MBTA Train Operational Efficiency**

The MBTA Haverhill Line commuter rail service is operated with certain inefficiencies due to capacity constraints at the Bradford Yard in Haverhill, MA. The size of the Bradford Yard limits the number of trains that can be stored near the Haverhill Line's northern terminal and results in the need for the MBTA to run non-revenue trains to Somerville, MA at the end of daily operations for storage. Extending commuter rail service to Plaistow, NH and creating a new layover yard could enable the MBTA to streamline operations on the Haverhill Line through more efficient train movements.

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<sup>12</sup> "Labor Force and Unemployment." New Hampshire Employment Security, September 17, 2013, <http://www.nhes.nh.gov/elmi/statistics/laus-data.htm>

<sup>13</sup> "2012 Average Employment and Wages." Massachusetts Labor and Workforce Development [http://lmi2.detma.org/lmi/map\\_box.asp?title=Cambridge](http://lmi2.detma.org/lmi/map_box.asp?title=Cambridge), accessed November 10, 2013