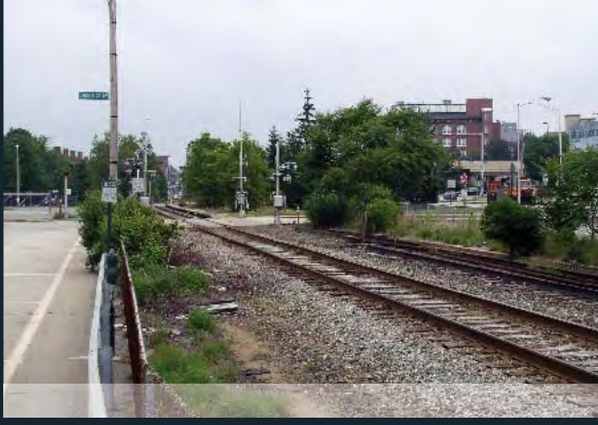

PURPOSE AND NEED REPORT

I-93 Transit Investment Study

Submitted to:
The New Hampshire Department of Transportation and Massachusetts Executive Office of Transportation

Submitted by:
HNTB Corporation

May 2007

HNTB

New Hampshire Department of Transportation
Massachusetts Executive Office of Transportation

I-93 Transit Investment Study
Purpose and Need Report

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HNTB

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May 2007

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I. Purpose and Need

A. Introduction

The New Hampshire Department of Transportation (NHDOT), in consultation with the Federal Highway Administration (FHWA) and the Massachusetts Executive Office of Transportation (MA EOT), has undertaken this study of transit alternatives to address future travel demands and to identify potential and feasible transportation modal alternatives for travel between southern New Hampshire and the Greater Metropolitan Boston area, including outlying suburbs along I-93, I-495 and I-95 (Route 128). From this study, the project sponsors hope to determine future transit investments necessary to meet mobility needs within the study area and develop a strategic plan for funding and phased implementation of recommended options.

B. Project Purpose

The purpose of I-93 Transit Investment Study (TIS) is to identify solutions to increase mobility options for New Hampshire residents to access major employment centers within the project corridor by enhancing existing or establishing additional alternative transportation modes to the single occupant vehicle. This analysis of alternative transportation modes is being undertaken to provide travel choices for commuters and to manage congestion, improve air quality, and conserve natural resources.

C. Project Need

1. Levels of roadway congestion are projected to increase along the corridor between New Hampshire and many area employment centers

The need for travel choices is driven by rapidly expanding population growth in southern New Hampshire and eastern Massachusetts, areas which have experienced some of the highest growth rates of any area throughout the U.S. over the past 30 years.

Travel patterns have dramatically shifted since the 1980s, as escalating housing costs in the Boston area have driven Boston workers to seek out more affordable housing outside of the Boston metropolitan area, resulting in outward migration of commercial and residential growth to the I-95 (Route 128) and I-495 corridor communities. This has resulted in longer commuting patterns as the highest rates of population growth have spread to areas outside the urban core. At the same time, Greater Boston still dominates the economy in Massachusetts and is an important employment destination for southern New Hampshire residents. Growing employment markets in southern New Hampshire have also contributed to increased travel demands in the Merrimack

Valley regions of both states. Recreational trips to destinations (lakes and mountains) in northern New Hampshire and Vermont from Massachusetts are another major factor causing increases in north-south regional travel demands.

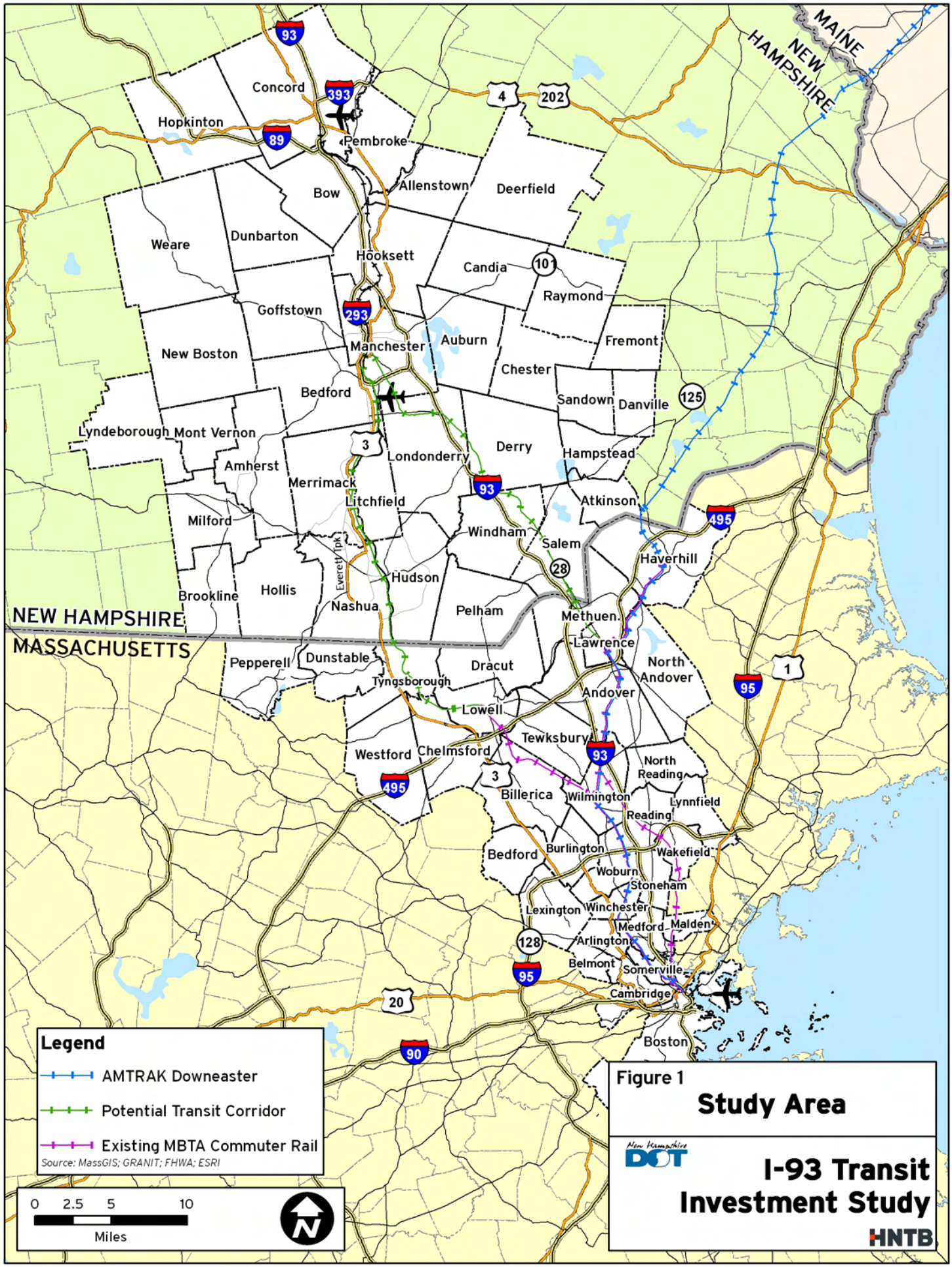
This increased interstate travel has placed demands on the existing transportation infrastructure, resulting in proposals for highway widening, on the major north-south highways servicing the Merrimack Valley Region in southern New Hampshire and Massachusetts (Interstate 93 and U.S. Route 3/F.E. Everett Turnpike) (Figure 1). Beyond the planned capacity expansions on Interstate 93 (I-93) and recently constructed lane additions on U.S. Route 3/F.E. Everett Turnpike in New Hampshire and Massachusetts, there is very limited opportunity to address transportation needs through further expansion of the highway system.

2. Mobility Options are Limited

Presently, there is no passenger rail service operating within the Merrimack Valley Region in New Hampshire. However, there are accessible regional and local bus services. Vermont Transit provides service between Manchester, NH and Boston (two southbound trips), with three additional trips from the Manchester-Boston Regional Airport. Peter Pan offers one daily roundtrip between Concord and Worcester with a stop in Manchester. Frequent weekday service is provided by Concord Trailways between Manchester and Boston with thirteen (13) southbound and sixteen (16) northbound trips. Bus service in the study area to Boston is also provided from Londonderry (Concord Trailways) via eight southbound and nine northbound trips. Nine (9) roundtrips are provided daily by Concord Trailways between the Nashua Park-and-Ride facility at Exit 8 and South Station and Logan Airport on the Boston Express. The privately operated bus services operating between New Hampshire and Boston offer only minor travel time savings since they operate in the general purpose travel lanes at the same speed as automobiles for most of the trip.

Although 13% of all work trips made in NH are made to MA, the only destination district which receives a transit mode share above 3% is the inner core of Boston. This inner core area receives a transit mode share of 11% of New Hampshire residents commuting to Boston with the limited service, as noted above. This percentage indicates the importance of transit for the work link between the Boston CBD and New Hampshire.

Traffic on the principal north-south arterial highways (I-93, U.S. Route 3, and F.E. Everett Highway) has dramatically increased, with growth rates of more than 50 percent since the 1980s. North of metropolitan Boston, traffic volumes recorded by MassHighway in 2005 were as high as 90,000 on U.S. Route 3, and I-93 traffic volumes ranged up to 170,000. Projections into the next 20 years indicate that this traffic will continue to grow as population expands in areas beyond the current commuting patterns. The combined impacts of longer work trip commuting and accompanying land development patterns has intensified public interest in the development of



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alternative transportation choices as the continued growth of traffic volumes cannot continue due to physical constraints to the highway system.

3. Continued rate of growth of vehicular travel will negatively impact the study area's environment

Without the infrastructure to support transit-oriented development in the study area, auto-oriented development will continue with its associated environmental and social impacts. The most notable impact of the existing development pattern is the increase in automobile use, continued and worsening congestion and the degradation of air quality that accompanies increased auto use.

As elaborated in the June 2006 *New Hampshire Long Range Transportation Plan*, residents of both New Hampshire and Massachusetts are becoming more concerned with the increased consumption of land, the changes to community and downtown character and associated impacts to the natural environment, in addition to environmental impacts.

A study conducted by the New Hampshire Office of State Planning, *Managing Growth in New Hampshire: Changes and Challenges* (December 2000) included a number of case studies in communities in New Hampshire to gain a better understanding of land development patterns in New Hampshire and to understand the regional impact of growth and development. The investigations highlighted a variety of issues among them that "residential development accounts for the conversion of the largest amount of undeveloped land in the study area communities in the 18-year study period [between 1974 and 1992]. The increasing scale of subdivisions over time has increased the fragmentation of large blocks of forest land."

4. Economic Development is Constrained

Roadway traffic congestion and limited mobility options pose impediments to economic development in many areas within the study area. It limits the development capacity and quality of life in developed areas and can restrain emerging areas from reaching their full potential.

The *Commonwealth of Massachusetts Long-Range Transportation Plan* (2006) notes as an important trend: "The combination of high cost of living and increasing congestion, commuting distances, and commute times is threatening Massachusetts' ability to attract and retain workers…The Commonwealth has experienced a net population loss in each of the last two years…While there are many factors that contribute to this decline, access to good employment opportunities and reasonably priced housing are considered primary issues in this outward migration. Transportation planning and investment will have a dramatic impact on both of these. Because preserving our quality of life and economic competitiveness are mutually reinforcing goals, the planning and management of our state's infrastructure must support economic development that is sustainable."

5. Lack of implementation strategy for an integrated transportation and land use vision for the area

The development of a coordinated implementation strategy for expanding transportation options is important for the future of New Hampshire businesses and residents to enhance access to jobs and reduce the growth of traffic congestion.

The NHDOT within the *I-93 Salem to Manchester Improvements Final Environmental Impact Statement* (FEIS), April 2004, has committed to funding a five-year comprehensive Community Technical Assistance Program (CTAP) to support a region of 26 towns and cities that are in the area influenced by the planned reconstruction of Interstate 93. The CTAP Resource Book 2, *Technical Assistance and Resource Identification*, cites burgeoning employment growth in New Hampshire and states that: "The benefit of these new jobs for New Hampshire, and specifically the I-93 corridor communities, depends in large part on the types of jobs that are created and the nature of the new development associated with the creation of these new jobs. Business development that is directed toward established city and town centers could strengthen these centers and enhance New Hampshire's traditional development patterns. Locating new businesses in existing developed areas could also curb sprawl, reduce travel demand and traffic congestion, and support development and expansion of public transportation."

D. Study Goals and Objectives

The I-93 TIS is the beginning of an effort to identify what should be done in the future to accommodate the travel demands of the future within the corridor between Manchester, NH and Boston, MA. This study will fit into a broader effort that will look not only at transportation but also at development, growth and environmental and community protection efforts. The specific goals of the I-93 TIS are to:

- Identify potential feasible opportunities, and establish funding priorities, for bi-state investments in transit (bus and rail),
- Develop a strategic plan for funding and phased implementation of recommended options, incorporating agency, community, and stakeholder inputs,
- Develop alternatives that will support Transit Oriented Development and be consistent with Smart Growth initiatives in both states.

The associated objectives and potential evaluation measures are identified as follows:

- Accommodate Growth in Longer Distance (north-south) Travel Markets
- Increase Mobility Options

Increasing the mobility options in the study area should result in providing opportunities for residents of New Hampshire and Massachusetts while minimizing the impact to area roadways. This will serve to improve the efficiency and effectiveness of the region's transportation system. Measures that will be helpful in evaluating the value of potential mobility options include:

- Capital Cost
- Cost-Effectiveness
- Ridership
- User Benefits (Travel Time Savings)
- Mode Shift
- Land Use and Development Impacts
- Environmental Impacts
- Public Support

- Improve Economic Development Opportunities
- Support Regional Strategies
- Help Attain Regional Environmental Objectives

  Mobility improvements should contribute to the attainment and long-term maintenance of conformity with National Ambient Air Quality Standards. Mobility improvements should improve overall environmental conditions in the study area and minimize adverse affects. Factors to be considered in evaluating environmental impacts of alternatives include:

  - Land Use and Zoning
  - Vehicular Travel/Congestion
  - Regional/Mesoscale Air Quality
  - Noise/Vibration
  - Historical/Archeological Resources
  - Recreation/Parklands
  - Water Resources and Wetlands
  - Hazardous Materials

E. Organization of Report

The following chapters describe the background and context for the I-93 TIS and address:

- Project History and Prior Studies,
- Existing Conditions (Population and Employment and Transportation systems), and
- Consistency with New Hampshire and Massachusetts Long Range Plans.

II. Project History and Prior Studies

A. I-93 Salem to Manchester, NH Corridor Improvements

The need for the current study was identified in addressing travel demands along the section of I-93 that extends north of the border with Massachusetts at Salem, New Hampshire to Manchester, New Hampshire. This roughly 20-mile section of I-93 is the focus of transportation improvements planned to be undertaken by the New Hampshire Department of Transportation. The proposed I-93 improvements include widening this section of the major north-south interstate highway to four travel lanes in each direction from its current configuration of two lanes in each direction.

The need to address transit improvements became apparent during preparation of the Final Environmental Impact Statement (FEIS) for the I-93 Corridor Improvements. The April 2004 FEIS considered an array of alternatives that included Transportation Demand Management measures and modal alternatives, including a Passenger Rail Service alternative and a Bus Service alternative. During the FEIS preparation and review, a separate bi-state study of future transit investments, separate from the proposal for road-based improvements, was requested by the U.S. Environmental Protection Agency.

The rail alternatives considered as part of the I-93 FEIS included four rail alternatives along three basic rail alignments. These rail alternatives were designed to provide commuter rail service to Boston from Manchester to provide some measure of traffic relief within the I-93 highway corridor during peak travel periods. Alternatives that were identified included alignments following two rail corridors that were once part of the former Boston and Maine (B&M) Railroad's system. These rail corridors extended from Manchester, New Hampshire to Lowell, Massachusetts (West Rail Corridor) and to Lawrence, Massachusetts (East Rail Corridor) (Figure 2).

In addition to evaluating service along these existing rail corridors, options to introduce new services along the existing I-93 highway corridor were also considered (Figure 3). The major mode alternatives that were evaluated as part of the I-93 Improvements project included:

- **West Rail Corridor from Manchester, New Hampshire via Nashua to Lowell, Massachusetts:** Commuter rail service along the New Hampshire Main Line would include Phase 1 (service between Nashua and Lowell), which is currently in preliminary planning. Phase 2 was considered as a mode alternative for the I-93 corridor and would extend service from Nashua 19 miles north to Manchester. This line would operate as a 31-mile extension of the Massachusetts Bay Transportation Authority (MBTA) Lowell Line, which extends 25 miles from Boston to Lowell. This railroad alignment extends along the west side of the Merrimack River parallel to U.S. Route 3 and the F.E. Everett Turnpike

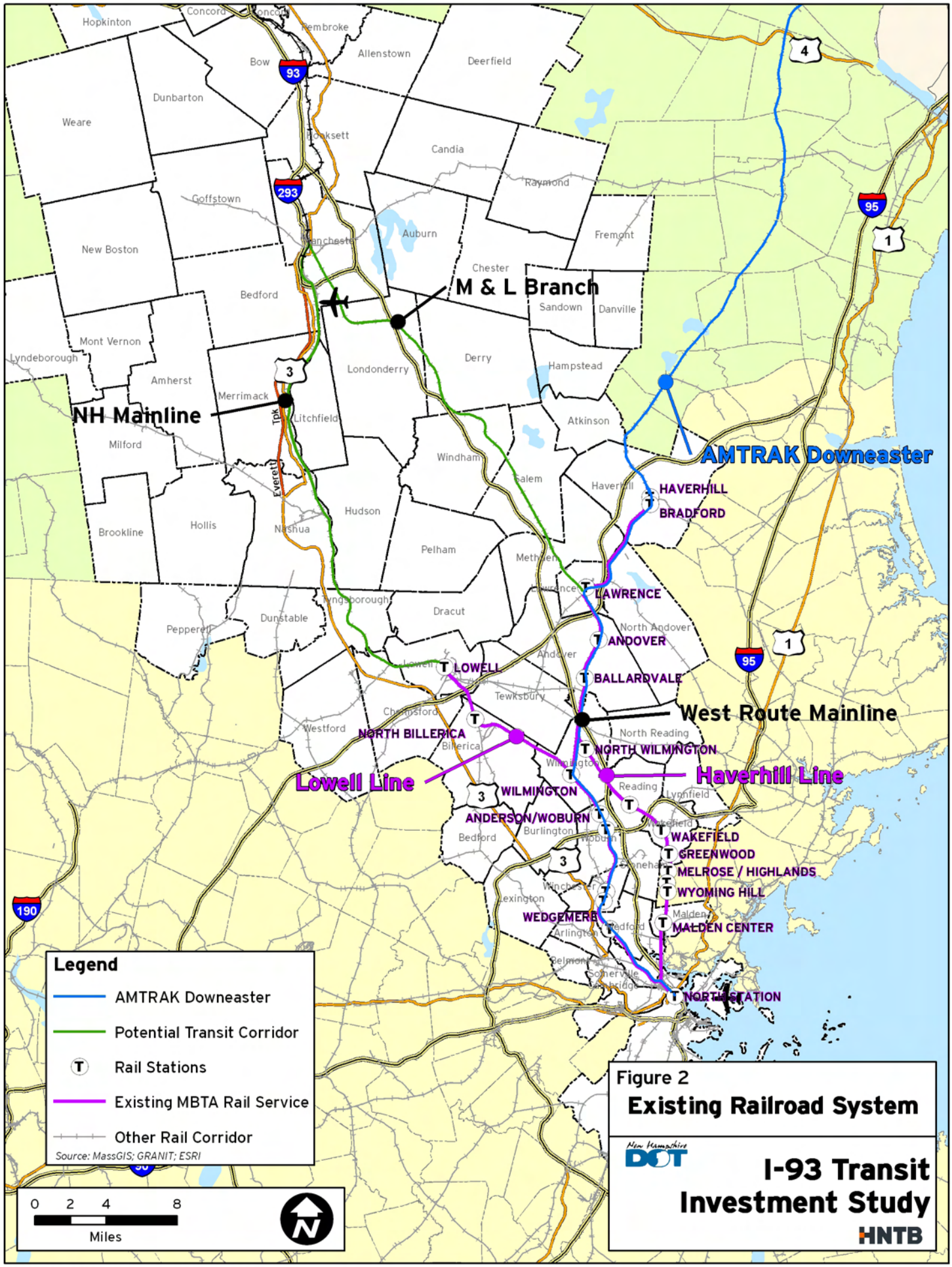
M & L Branch
NH Mainline
AMTRAK Downeaster
West Route Mainline
Lowell Line
Haverhill Line
HAVERHILL
BRADFORD
LAWRENCE
ANDOVER
BALLARDVALE
LOWELL
NORTH BILLERICA
NORTH WILMINGTON
WILMINGTON
ANDERSON/WOBURN
WAKEFIELD
GREENWOOD
MELROSE / HIGHLANDS
WYOMING HILL
MALDEN CENTER
WEDGEMERE
NORTH STATION
Legend
AMTRAK Downeaster
Potential Transit Corridor
Rail Stations
Existing MBTA Rail Service
Other Rail Corridor
Source: MassGIS; GRANIT; ESRI
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Figure 2
Existing Railroad System
I-93 Transit Investment Study
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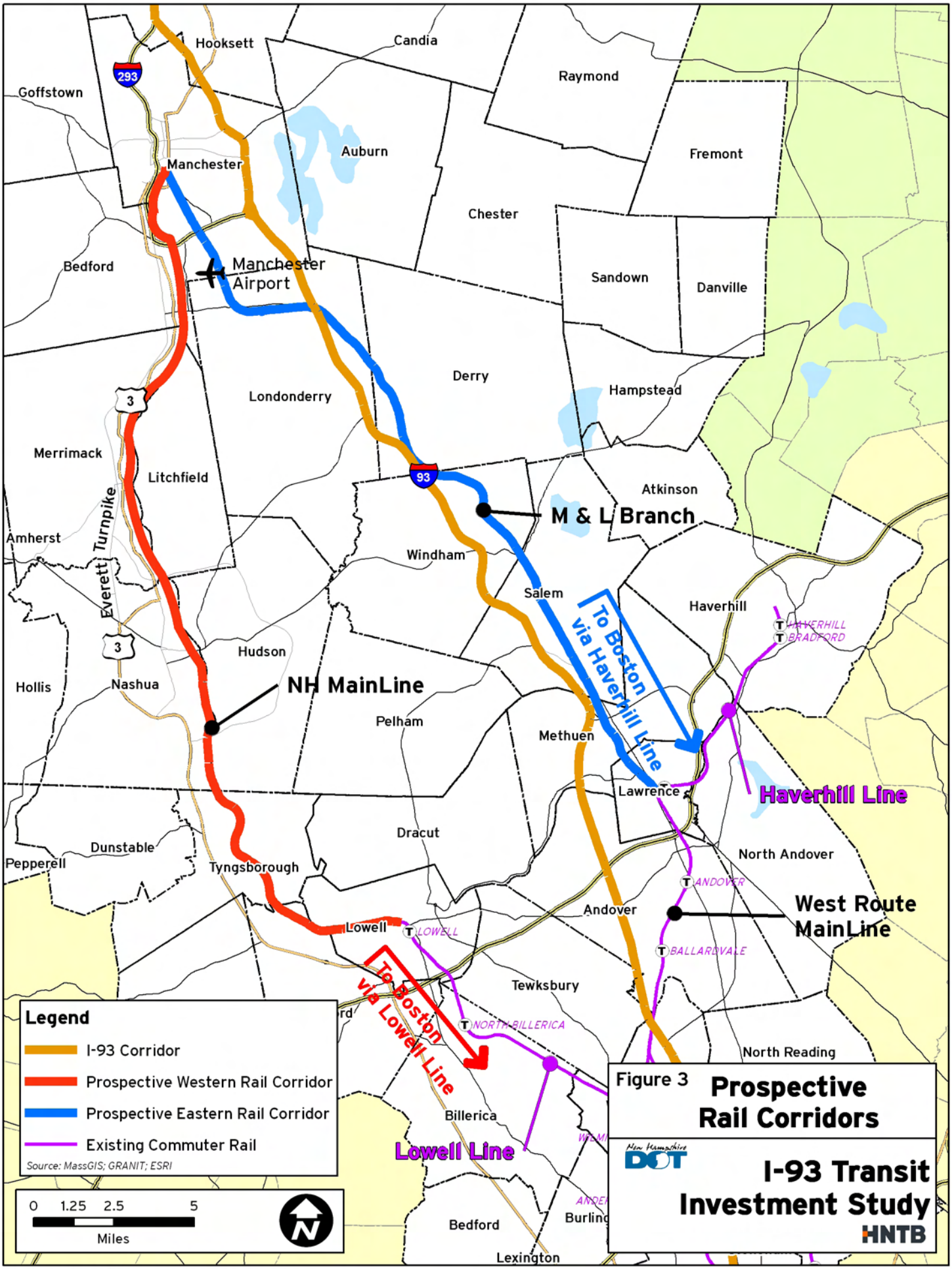

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(which splits from U.S. Route 3 north of Nashua, New Hampshire) thence crossing the river just south of Manchester, and would primarily serve as an alternative for commuters within the F.E. Everett Turnpike and U.S. Route 3 corridors.

- **East Rail Corridor from Manchester, NH to Lawrence, MA:** Commuter rail service along 28 miles of the Manchester & Lawrence (M&L) Branch, with two variations near the Manchester-Boston Regional Airport, would connect to the MBTA Haverhill Line in Lawrence. The Haverhill Line in Massachusetts operates predominantly along 32.9 miles of the West Route Main Line (WRML) tracks extending from North Station in Boston to downtown Haverhill. The line continues north into New Hampshire and Maine and is the route used by Amtrak's Downeaster passenger service between Boston and Portland, Maine. The route is also used by Pan Am Railways (successor to B&M) for freight service. The Haverhill Line includes a section of single track (13.9 miles) between Lawrence and Reading. Another 3.9-mile single-track section extends between the Boston/Somerville Line and Melrose.

  A constraint to the use of the M&L branch line is that the right-of-way is not exclusively state-owned in New Hampshire. Other public owners of the right-of-way are the Manchester Airport Authority and the Town of Derry. Private interests own portions of the right-of-way in Derry and Londonderry. In Massachusetts, the MBTA owns the right-of-way. Another constraint is that the track structure is in poor condition or non-existent, and new structures (bridges) would be required.

  A segment of the right-of-way in Manchester has been paved as a walkway and bikeway. A four-mile segment is paved within the town of Windham and is a popular bikeway and walking path. The route is also part of the recommended alternative for the Salem to Concord regional bikeway plan.

  An advantage of the East Rail Corridor is that it closely parallels I-93, and therefore would provide an alternative mode of transportation for I-93 corridor commuters.

- **I-93 Rail Corridor:** Two options for a new light rail service operating within the I-93 highway right-of-way were considered: a Basic and Enhanced Rail Corridor. The Enhanced Rail Corridor would continue service north to the Manchester-Regional Boston Airport. Both rail corridors would involve a connection to the M&L Branch three miles to the south near Exit 5 in Londonderry and light rail service continuing south along I-93 to the Massachusetts state line. The Basic Rail Corridor would extend 23 miles between Londonderry and Lawrence. Over the state line, the Basic Rail Corridor Option would connect to the M&L Branch right-of-way continuing to Lawrence, Massachusetts (Haverhill Line). The Enhanced Rail Corridor would deviate from this alignment in Massachusetts and would continue within the I-95 right-of-way 20 miles south to the Anderson Regional Transportation Center (Lowell Line) in Woburn. The proposed I-93 improvements included accommodating space within the reconstructed highway corridor for potential future rail or other mass transit opportunities. This reserved area within the I-93 right-of-way could accommodate a potential light rail line, but could alternatively provide for high occupancy vehicle (HOV) usage or bus rapid transit.

- **Bus Service:** An expansion of the private commuter bus service, operating from Manchester and Londonderry to Boston, was considered. Since bus service was operating only at Exit 4 in Londonderry, the I-93 improvements included expanding service to serve Exit 5 in Londonderry, Exit 3 in Windham, and Exit 2 in Salem. I-93 improvements included providing park and ride facilities at each interchange with bus terminal facilities to facilitate ride-sharing and bus transit usage. An enhanced ride-sharing program, with a commuter incentive program, was also considered.

The mode alternatives in the I-93 Improvements FEIS were considered to provide additional commuting options in the Merrimack Valley region in New Hampshire and Massachusetts. Analysis of alternatives undertaken for the I-93 improvements demonstrated that a passenger rail service would not divert sufficient vehicle trips from I-93 to make a marked improvement in I-93 traffic operations. The mode alternatives studied were intended to provide transportation enhancements that would supplement the highway system, rather than supplant the need for highway improvements. This was formally recognized by the resource and environmental agencies in a Memorandum of Agreement (MOA) that was signed in September 2001 that established the reasonable range of alternatives to be considered in the FEIS. In this agreement, the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the New Hampshire Department of Environmental Services, the New Hampshire Fish and Game Department, the New Hampshire Division of Historical Resources, the FTA, and the FHWA and NH DOT acknowledged that future initiatives to address transportation needs in the broader I-93 corridor (Greater Boston Metropolitan Area to Manchester, NH) would likely not involve further widening but rather some type of transit investment. The parties concurred that regional transit initiatives would be studied further in a separate study specific to transit conducted in partnership with the Commonwealth of Massachusetts.

The bus transit options identified in the FEIS were to be implemented in conjunction with the highway improvements identified. The preliminary passenger rail options identified were to undergo further evaluation as part of the current I-93 TIS. Although the genesis of this transit investment study arose as part of the NHDOT I-93 Corridor Study, it was recognized that a larger study of regional mobility options not only within the New Hampshire I-93 corridor, but within the entire southern New Hampshire Merrimack Valley Region and extending into Massachusetts, was required. This separate TIS, being undertaken in partnership with Massachusetts, is assessing potential regional transit opportunities and seeking to identify cross-border priorities for future investments that will be required to meet the long-term mobility needs in the region.

B. Lowell to Nashua Commuter Rail Extension Project

Implementation of rail service along the West Rail Corridor is being actively pursued by the Nashua Regional Planning Commission (NRPC), in partnership with the State of New Hampshire, the Federal Transit Administration (FTA), City of Nashua, the MBTA, and the

railroad owners and operators, as part of the Nashua to Lowell Commuter Rail Extension Project. NRPC is considering a phased approach for this project. Phase 1 of the project involves extending commuter rail service to Nashua (Phase 1) from Lowell and would represent the first step in initiating regional passenger service between Massachusetts and southern New Hampshire. This passenger service was originally evaluated in the *Major Investment Study for Nashua Passenger Rail Service* (MIS). Phase 2 would consider extending service 19 miles north from Nashua to Manchester.

NHDOT submitted the final version of the MIS to the FTA in the fall of 1999. The New Hampshire congressional delegation notified the NRPC in November 1999 that $1 million of a requested earmark of $16 million was available to initiate the environmental reviews and preliminary design. In March 2000, the state's Congestion Mitigation and Air Quality Advisory Committee approved a request for $12 million for purchasing coaches and locomotives for use on the project.

The MIS study for this project was used as the basis for the West Rail Corridor alternative evaluated in the I-93 Improvements FEIS.

In June 2006, Governor Lynch convened a group of stakeholders to discuss the issues surrounding the reintroduction of passenger rail in southern New Hampshire. The stakeholders included, but were not limited to, the Governor, Pan Am Railway, representatives from the Nashua and Southern New Hampshire Regional Planning Commissions, the cities of Nashua and Manchester, the Manchester-Boston Regional Airport, and the Greater Nashua Chamber of Commerce.

As a result, a small task force created a Southern New Hampshire Passenger Rail Proposal. Pan Am Railways would be the operator for the rail proposal with a proposed $113.6 million in funding from committed Congestion Mitigation Air Quality Funds ($21.5 million), committed Federal New Starts Funds ($4.3 million), new federal earmark ($65.1 million), and a match of $22.7 million of local contributions to station development. Currently, the task force is working through the various issues and tasks necessary to implement the service.

C. Northern New England High Speed Rail Corridor

The Northern New England High Speed Rail Corridor has been designated by the U.S. Secretary of Transportation. This federal designation allows states through which the high speed rail corridor passes to receive earmarked funds for study, design, and construction and allows funding for highway/rail grade crossing safety improvements. The Northern New England High Speed Rail Corridor has two branches in New England. The eastern branch extends between a hub in Boston and Portland, Maine terminating in Auburn, Maine. The western branch connects Boston and Montreal, Quebec, extending through Concord, New Hampshire and Montepelier, Vermont.

The Boston to Montreal High-Speed Rail Planning and Feasibility Study, Phase I Final Report, prepared by the Vermont Department of Transportation, was completed in April 2003. The report concluded that projected fare revenue and ridership is sufficient to warrant further study and implementation of Phase II evaluations. The study indicated that implementation of high speed rail would require substantial rail infrastructure improvements that would be compatible with existing and future passenger and freight rail operations. The potential rail corridor identified for further study follows the West Rail Corridor that extends from Manchester through Nashua and Lowell to Boston.

D. I-93 Corridor Study, Andover and Methuen, MA

In addition to these prior studies performed by NHDOT, the Merrimack Valley Planning Commission has also evaluated improvements to a roughly 10-mile section of I-93 extending south from New Hampshire to Methuen and Andover. The study area focuses on the section of I-93 that consists of three travel lanes in each direction and continues as a six-lane highway to the New Hampshire border. The southern limit of the study occurs at the neckdown from four to three lanes in each direction. In the spring of 1999, Massachusetts Highway Department initiated use of the breakdown lanes for general travel in this highway segment during morning (6 a.m. to 10 a.m.) and evening (3 p.m. to 7 p.m.) peak periods, as an interim measure to relieve severe congestion that occurs along this divided highway.

The *I-93 Corridor Traffic Study, Andover and Methuen, Massachusetts* considered a range of alternatives, including widening I-93 from three to four lanes in each direction. The study also included evaluation of interchange and intersection improvements, including a potential new interchange at Lowell Junction between Exits 41 and 42, as described in the following section.

Experimental bus improvements were also to be implemented in and along the I-93 corridor as part of the project. The study recommended experimenting with adding service in various new areas to determine if a market exists. The study also recommended further evaluation of the potential for valet parking to increase parking capacity at rail stations.

Other options involving shuttle services (commuter rail or bus) to the Anderson Regional Transportation Center, connecting to the Lowell Line, were determined to not be viable alternatives, since ample parking was available at the center. It was recommended that parking conditions at the Anderson Regional Transportation Center be monitored, and these alternatives reconsidered in the event that parking becomes constrained in the future.

The study included the recommendation that improvements be made to the Haverhill Line (through double tracking) to accommodate increased commuter rail service. The study identified other potential passenger rail alternatives in Massachusetts (including commuter rail or light rail service operating along the M&L Branch, commuter rail through service between Manchester and Boston via the Haverhill Line, and light rail service along I-93) that would require coordination with New Hampshire for implementation. The study also calls for a cooperative study by New

Hampshire and Massachusetts to consider options for regional rail service between Boston and Manchester.

E. I-93/Junction Interchange, Andover, Wilmington, and Tewksbury, MA

The *I-93 Corridor Traffic Study, Andover and Methuen, Massachusetts* recommended further consideration of a potential new interchange on I-93 in the Lowell Junction area, between Route 125 in Wilmington (Exit 41) and Dascomb Road in Andover (Exit 42). This area includes landlocked parcels and is viewed as having substantial economic development potential, since it currently hosts a number of large area businesses and is a major employment center. These transportation improvements are consistent with plans for expansion by existing large area employers and other private development proposals, which are currently impeded by the lack of direct access to I-93 and recurring traffic congestion. Lack of direct access from I-93 to businesses in the Lowell Junction area contributes to congestion at adjoining interchanges, leading local residents to file suit to stop further development that would increase employment in the area.

The I-93/Lowell Junction Interchange Justification Study is being undertaken as a separate project by the Merrimack Valley Planning Commission, in collaboration with the three communities of Andover, Tewksbury, and Wilmington. This interchange justification study was completed in 2006 and was submitted by the Massachusetts Executive Office of Transportation to the Federal Highway Administration for review and approval.

In addition, officials from Andover, Wilmington and Tewksbury are now cooperating to identify a shared development strategy for the area. Plans for "The Junction Project" are outlined in *The Junction/Route 93 Development Area: Our Opportunity for Smart Growth and Regional Economic Development in the Merrimack Valley and Northeast Massachusetts* prepared by the Merrimack Valley Economic Development Council. The development envisioned for the area includes a new multi-modal transit center to be located adjacent to the Haverhill Line, with access to be provided by the new I-93 Interchange.

F. Interstate Memorandum of Agreement for Current Study

In March 2005, a Memorandum of Agreement (MOA) between the NHDOT and the MA EOT was executed. In the MOA, the agencies agreed to jointly undertake a Transit Investment Study of the Boston to Manchester leg of the I-93 corridor. The study was viewed by both states as an opportunity to jointly address Massachusetts and New Hampshire regional transportation issues.

III. Existing Conditions

A. Population and Employment

The potential market area, and study area, for the I-93 TIS was defined to include 38 communities within Hillsborough (Manchester area), Rockingham, and Merrimack Counties in southern New Hampshire and 32 communities within Essex, Middlesex, and Suffolk Counties in Massachusetts. The study area includes regions that are covered by four regional planning commissions in New Hampshire and three regional planning commissions in Massachusetts (Figure 4 and Table 1).

These include, on the north, the Central New Hampshire Regional Planning Commission Concord District in Table 1) and the Southern New Hampshire Planning Commission (Southern District in Table 1). In southern New Hampshire, the Nashua Regional Planning Commission (Nashua District) borders Massachusetts on the west and the Rockingham Planning Commission (Rockingham District) extends along the state border on the east. In northern Massachusetts, the Northern Middlesex Council of Governments (Northern Middlesex District), on the west, and the Merrimack Valley Planning Commission (Merrimack Valley District), on the east, cover the areas outside of the Metropolitan Area Planning Council (MAPC) region. The MAPC region covers the inner core and outer core areas of Boston (Figure 4 and Table 1).

Table 1-I-93 Study Area Planning Districts and Communities

New Hampshire	
Concord District – Cities and Towns	
Allenstown	Dunbarton
Bow	Hopkington
Concord	Pembroke
Nashua District – Cities and Towns	
Amherst	Lyndeborough
Brookline	Merrimack
Hollis	Milford
Hudson	Mount Vernon
Nashua	Pelham
Litchfield	
Rockingham District – Cities and Towns	
Atkinson	Salem
Danville	Sandown
Fremont	Windham
Hampstead	

Table 1-I-93 Study Area Planning Districts and Communities	
Southern District – Cities and Towns	
Auburn	Hooksett
Bedford	Londonderry
Candia	Manchester
Chester	New Boston
Deerfield	Raymond
Derry	Weare
Goffstown	
Massachusetts	
Boston Inner Core – Cities and Towns	
Boston	Cambridge
Boston Outer Core – Cities and Towns	
Arlington	North Reading
Bedford	Reading
Belmont	Somerville
Burlington	Stoneham
Lexington	Wakefield
Lynnfield	Wilmington
Malden	Winchester
Medford	Woburn
Northern Middlesex District – Cities and Towns	
Billerica	Pepperell
Chelmsford	Tewksbury
Dracut	Tyngsborough
Dunstable	Westford
Lowell	
Merrimack Valley District – Cities and Towns	
Andover	Methuen
Haverhill	North Andover
Lawrence	

1. Population Trends

Population densities in the study area are highest within the Boston metropolitan area, as shown in Figure 6. Population changes from 1980, 2000, and 2030 for the study area communities in Massachusetts and New Hampshire are shown in Table 2 and Figures 5, 7, 8, 9, 10, and 11. Between 1980 and 2000, the study area communities in Massachusetts added roughly 120,000 residents, or about 6,000 per year (Figure 5). Over the same time period, New Hampshire study area communities added about 176,000 residents, or approximately 8,800 per year (Figure 5).

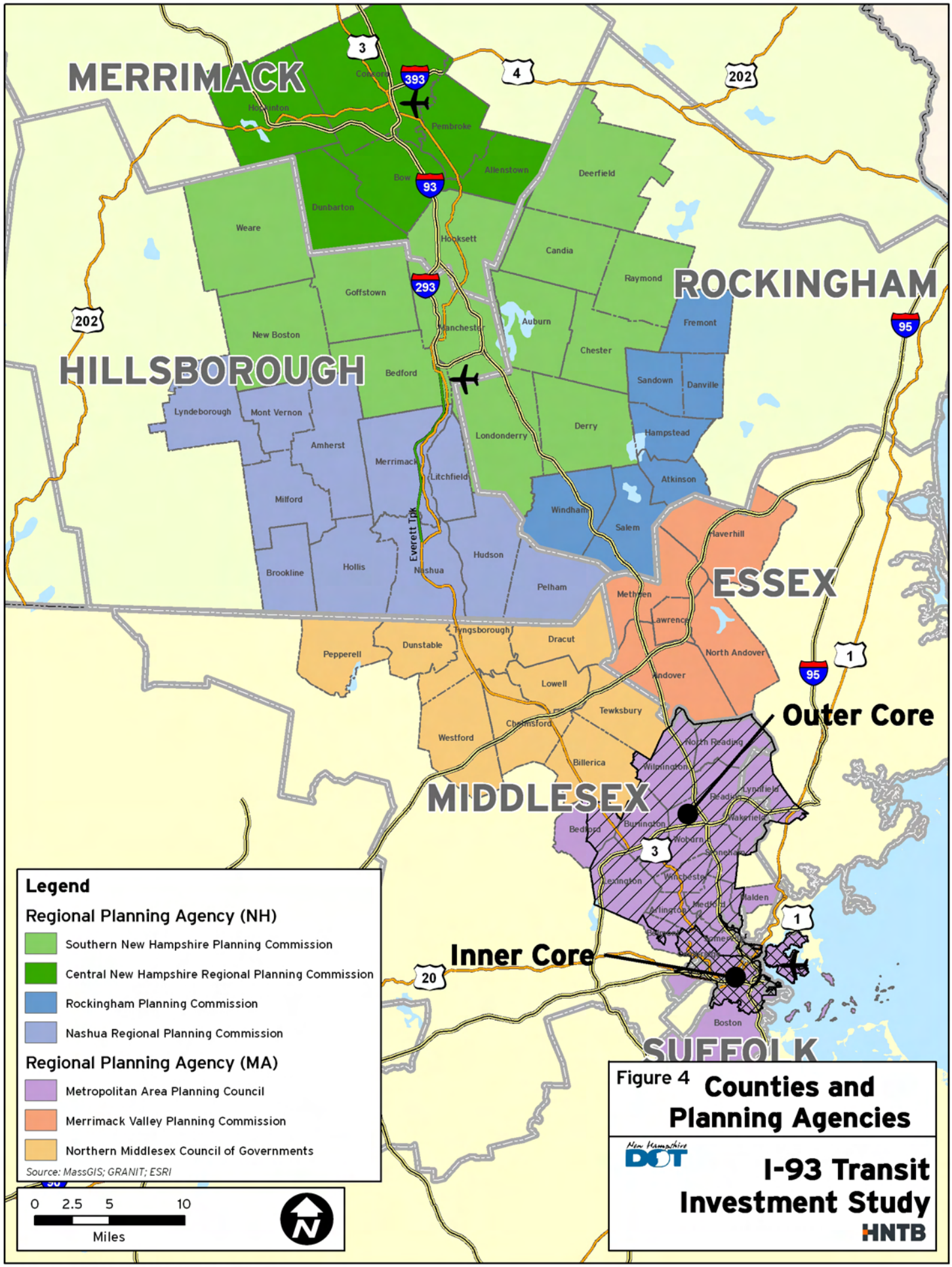

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Table 2-Population and Employment Characteristics (1980, 2000, 2030)

LOCATION		POPULATION					EMPLOYMENT			
CITY/TOWN	STATE	1980	2000	2030	2000 to 2030 Change		2000	2030	2000 to 2030 Change	
					Total	%			Total	%
Andover	MA	26,370	31,972	37,360	5,388	17%	34,501	39,385	4,884	14%
Arlington	MA	48,219	42,391	44,164	1,773	4%	8,545	8,973	428	5%
Bedford	MA	13,067	12,597	13,864	1,267	10%	21,971	24,995	3,024	14%
Belmont	MA	26,100	24,194	25,750	1,556	6%	6,252	6,494	242	4%
Billerica	MA	36,727	38,978	43,863	4,885	13%	25,750	30,585	4,835	19%
Boston	MA	562,994	592,358	631,315	38,957	7%	559,421	609,971	50,550	9%
Burlington	MA	23,486	22,876	24,720	1,844	8%	38,178	43,900	5,722	15%
Cambridge	MA	95,322	101,650	116,225	14,575	14%	110,706	120,143	9,437	9%
Chelmsford	MA	31,174	33,615	36,317	2,702	8%	22,000	25,761	3,761	17%
Dracut	MA	21,249	28,564	33,201	4,637	16%	4,705	5,190	485	10%
Dunstable	MA	1,671	2,829	3,330	501	18%	254	289	35	14%
Haverhill	MA	46,865	58,968	66,278	7,310	12%	19,223	19,911	688	4%
Lawrence	MA	63,175	72,043	78,429	6,386	9%	23,304	19,791	-3,513	-15%
Lexington	MA	29,479	30,356	33,263	2,907	10%	21,210	23,712	2,502	12%
Lowell	MA	92,418	105,169	114,703	9,534	9%	34,652	33,367	-1,285	-4%
Lynnfield	MA	11,267	11,542	12,484	942	8%	4,786	6,162	1,376	29%
Malden	MA	53,386	56,300	61,934	5,634	10%	17,366	16,519	-847	-5%
Medford	MA	58,076	55,809	57,675	1,866	3%	19,722	20,931	1,209	6%
Methuen	MA	36,701	43,790	48,752	4,962	11%	13,717	15,924	2,207	16%
North Andover	MA	20,129	26,477	31,213	4,736	18%	19,017	20,495	1,478	8%
North Reading	MA	11,455	13,837	13,836	-1	0%	7,019	7,021	2	0%
Pepperell	MA	8,061	11,142	13,064	1,922	17%	1,492	1,729	237	16%
Reading	MA	22,678	23,708	26,731	3,023	13%	7,252	8,060	808	11%
Somerville	MA	77,372	77,494	79,870	2,376	3%	21,613	25,826	4,213	19%
Stoneham	MA	21,424	22,218	25,188	2,970	13%	7,722	8,493	771	10%
Tewksbury	MA	24,635	28,851	32,125	3,274	11%	17,234	20,661	3,427	20%
Tyngsborough	MA	5,683	11,081	13,742	2,661	24%	4,056	4,962	906	22%
Wakefield	MA	24,895	24,802	27,616	2,814	11%	14,968	15,461	493	3%
Westford	MA	13,434	20,754	24,232	3,478	17%	11,052	12,723	1,671	15%
Wilmington	MA	17,471	21,363	25,367	4,004	19%	21,060	24,664	3,604	17%
Winchester	MA	20,701	20,808	21,822	1,014	5%	7,302	7,764	462	6%
Woburn	MA	36,626	37,258	40,014	2,756	7%	40,591	48,070	7,479	18%

Sources: 1980 and 2000 Census, New Hampshire Department of Transportation (2030 NH data), Central Transportation Planning Staff (CTPS) (2030 MA data).

Table 2-Population and Employment Characteristics (1980, 2000, 2030)

LOCATION		POPULATION					EMPLOYMENT			
CITY/TOWN	STATE	1980	2000	2030	2000 to 2030 Change		2000	2030	2000 to 2030 Change	
					Total	%			Total	%
Allenstown	NH	4,398	4,539	6,133	1,594	35%	1,235	1,808	573	46%
Amherst	NH	8,243	10,735	14,928	4,193	39%	4,304	5,032	728	17%
Atkinson	NH	4,397	6,185	8,433	2,248	36%	745	1,178	433	58%
Auburn	NH	2,883	4,688	6,481	1,793	38%	874	1,387	513	59%
Bedford	NH	9,481	19,194	26,514	7,320	38%	11,516	17,974	6,458	56%
Bow	NH	4,015	6,564	11,337	4,773	73%	5,234	7,671	2,437	47%
Brookline	NH	1,766	4,318	6,675	2,357	55%	655	817	162	25%
Candia	NH	2,989	3,865	5,197	1,332	34%	570	898	328	58%
Chester	NH	2,006	4,225	5,982	1,757	42%	335	532	197	59%
Concord	NH	30,400	39,993	53,527	13,534	34%	43,694	64,032	20,338	47%
Danville	NH	1,318	4,077	5,741	1,664	41%	127	200	73	57%
Deerfield	NH	1,979	3,678	5,410	1,732	47%	499	704	205	41%
Derry	NH	18,875	32,885	42,114	9,229	28%	7,754	12,254	4,500	58%
Dunbarton	NH	1,174	2,438	3,681	1,243	51%	358	524	166	46%
Fremont	NH	1,333	3,606	5,182	1,576	44%	282	447	165	59%
Goffstown	NH	11,315	16,558	23,400	6,842	41%	3,722	5,817	2,095	56%
Hampstead	NH	3,785	8,035	11,445	3,410	42%	2,225	3,521	1,296	58%
Hollis	NH	4,679	7,082	10,378	3,296	47%	2,670	3,442	772	29%
Hooksett	NH	7,303	12,268	19,571	7,303	60%	6,343	10,028	3,685	58%
Hopkinton	NH	3,861	4,988	7,004	2,016	40%	1,839	2,694	855	46%
Hudson	NH	14,022	22,753	32,656	9,903	44%	11,532	15,433	3,901	34%
Litchfield	NH	4,150	7,600	12,811	5,211	69%	590	1,241	651	110%
Londonderry	NH	13,598	23,004	32,593	9,589	42%	7,192	11,369	4,177	58%
Lyndeborough	NH	1,070	1,636	2,305	669	41%	81	101	20	25%
Manchester	NH	90,936	102,207	125,601	23,394	23%	63,626	99,342	35,716	56%
Merrimack	NH	15,406	25,037	36,051	11,014	44%	12,262	22,091	9,829	80%
Milford	NH	8,685	13,647	19,230	5,583	41%	6,776	8,208	1,432	21%
Mont Vernon	NH	1,444	2,145	2,934	789	37%	110	133	23	21%
Nashua	NH	67,865	82,049	99,602	17,553	21%	53,692	69,856	16,164	30%
New Boston	NH	1,928	4,475	6,496	2,021	45%	375	593	218	58%
Pelham	NH	8,090	11,890	22,727	10,837	91%	1,985	2,536	551	28%
Pembroke	NH	4,861	6,347	8,996	2,649	42%	2,043	2,994	951	47%
Raymond	NH	5,453	9,625	13,120	3,495	36%	2,853	4,508	1,655	58%
Salem	NH	24,124	27,275	35,567	8,292	30%	20,864	32,984	12,120	58%
Sandown	NH	2,057	5,233	7,466	2,233	43%	127	204	77	61%
Weare	NH	3,232	7,776	11,845	4,069	52%	1,309	1,841	532	41%
Windham	NH	5,664	11,409	15,970	4,561	40%	2,129	3,365	1,236	58%

Sources: 1980 and 2000 Census, New Hampshire Department of Transportation (2030 NH data), Central Transportation Planning Staff (CTPS) (2030 MA data).

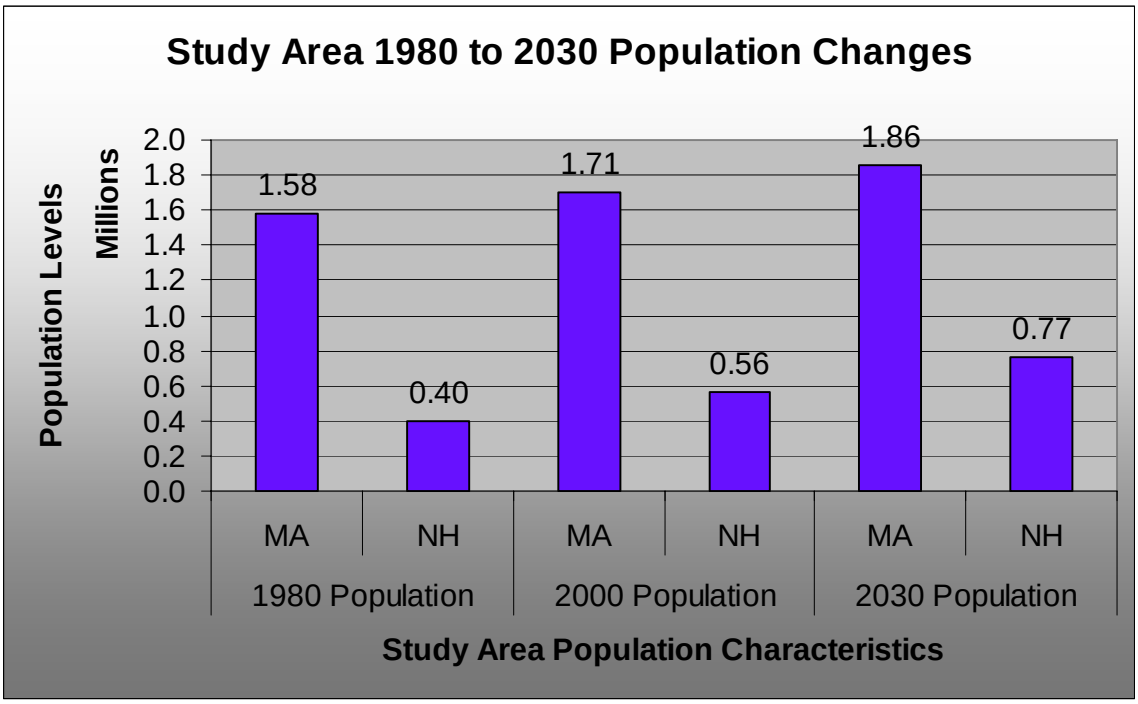


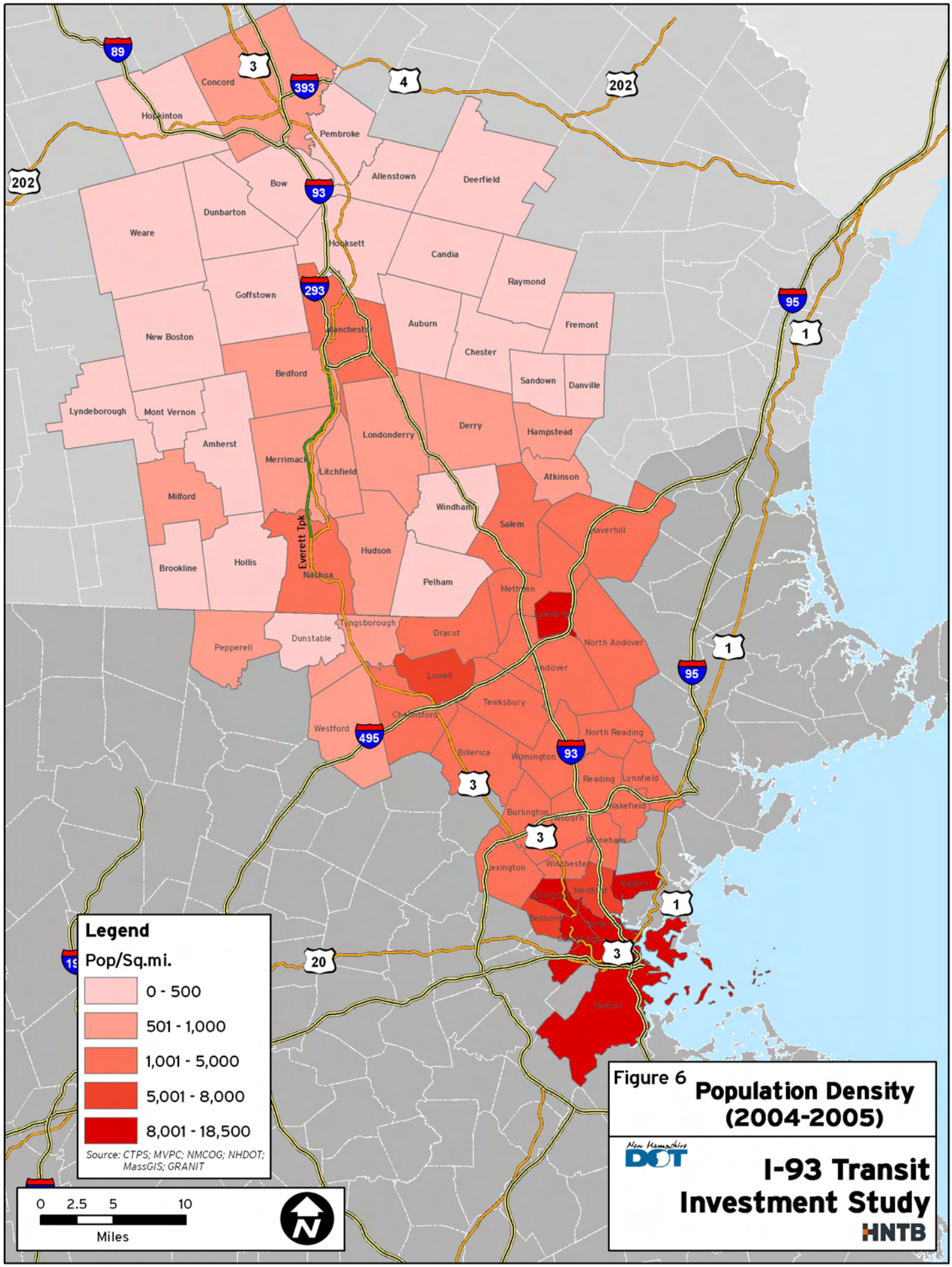
Figure 5-Study Area 1980 to 2030 Population Changes

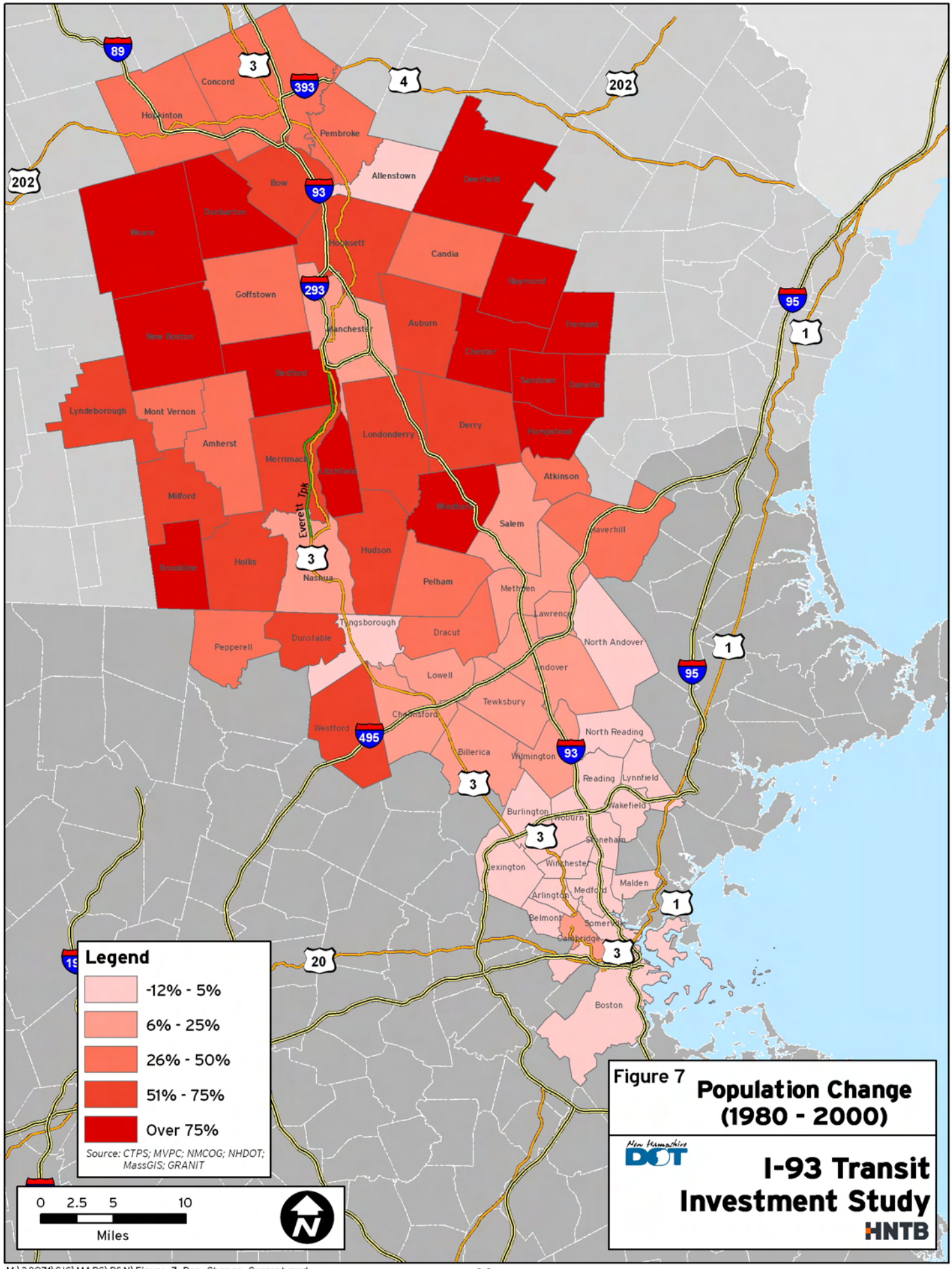
Sources: 1980 and 2000 Census, New Hampshire Department of Transportation (2030 NH data), Central Transportation Planning Staff (CTPS) (2030 MA data).

Between 1980 and 2030, population increased by roughly 18% in Massachusetts and by approximately 92% in New Hampshire.

The largest historic population increases occurred in the Boston Central Business District, in other more urbanized areas, or in outlying areas with large areas of undeveloped lands. In Massachusetts, the greatest population increases between 1980 and 2000 occurred in Boston (29,364), Haverhill (12,103), Lawrence (8,868), Dracut (7,315), Methuen (7,089), and Westford (7,320). In New Hampshire, the highest population increases between 1980 and 2000 occurred in Nashua (18,740), Manchester (16,070), Derry, (15,146), and Concord (10,287). Most of these communities with the highest population gains are located along the I-93 or U.S. Route 3 and/or F.E. Everett Turnpike corridors.

Massachusetts study area communities are expected to add roughly 153,000 new residents between 2000 and 2030, or about 5,000 new residents per year (Figures 5, 10, and 11). New Hampshire study area communities are expected to add approximately 200,000 new residents over the same time period, or roughly 6,700 new residents per year. By 2030, total population is expected to increase by roughly 9% in Massachusetts and by approximately 36% in New Hampshire.


Legend
Pop/Sq.mi.
0 - 500
501 - 1,000
1,001 - 5,000
5,001 - 8,000
8,001 - 18,500
Source: CTPS; MVPC; NMCOG; NHDOT; MassGIS; GRANIT
0 2.5 5 10
Miles
Figure 6
Population Density (2004-2005)
I-93 Transit Investment Study
HNTB
Concord
Hopkinton
Pembroke
Allenstown
Deerfield
Bow
Dunbarton
Weare
Hooksett
Candia
Raymond
Goffstown
New Boston
Auburn
Chester
Fremont
Sandown
Danville
Bedford
Manchester
Lyndeborough
Mont Vernon
Amherst
Merrimack
Litchfield
Londonderry
Derry
Hampstead
Atkinson
Milford
Windham
Salem
Haverhill
Brookline
Hollis
Hudson
Nashua
Pelham
Methuen
Tyngsborough
Dracut
North Andover
Pepperell
Dunstable
Lowell
Andover
Tewksbury
Chelmsford
Westford
North Reading
Billerica
Wilmington
Reading
Lynnfield
Burlington
Woburn
Wakefield
Stoneham
Winchester
Lexington
Medford
Malden
Belmont
Boston
Everett Tpk



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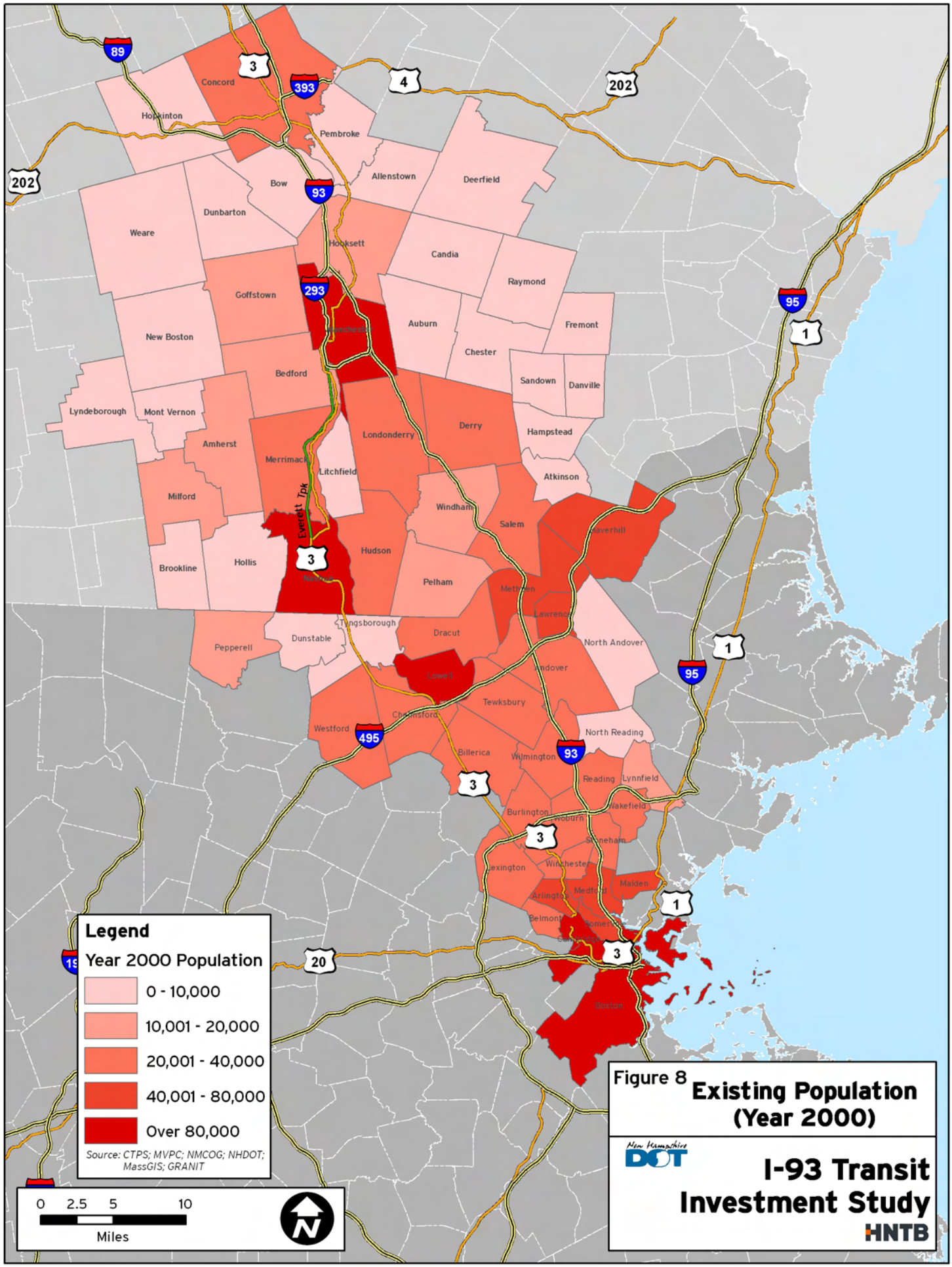
Legend
Year 2000 Population
0 - 10,000
10,001 - 20,000
20,001 - 40,000
40,001 - 80,000
Over 80,000
Source: CTPS; MVPC; NMCOG; NHDOT; MassGIS; GRANIT
0 2.5 5 10
Miles
Figure 8
Existing Population (Year 2000)
I-93 Transit Investment Study
HNTB
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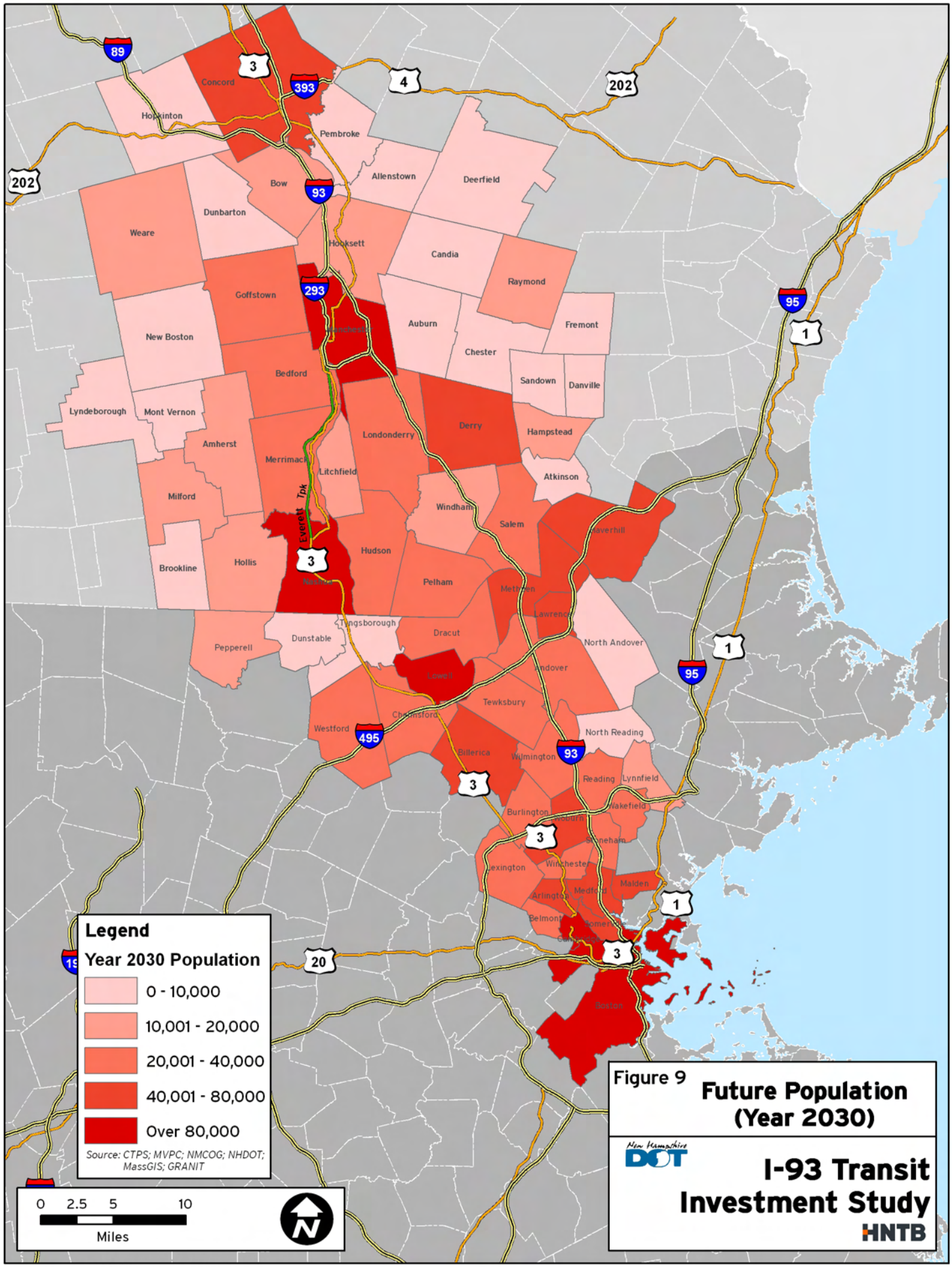

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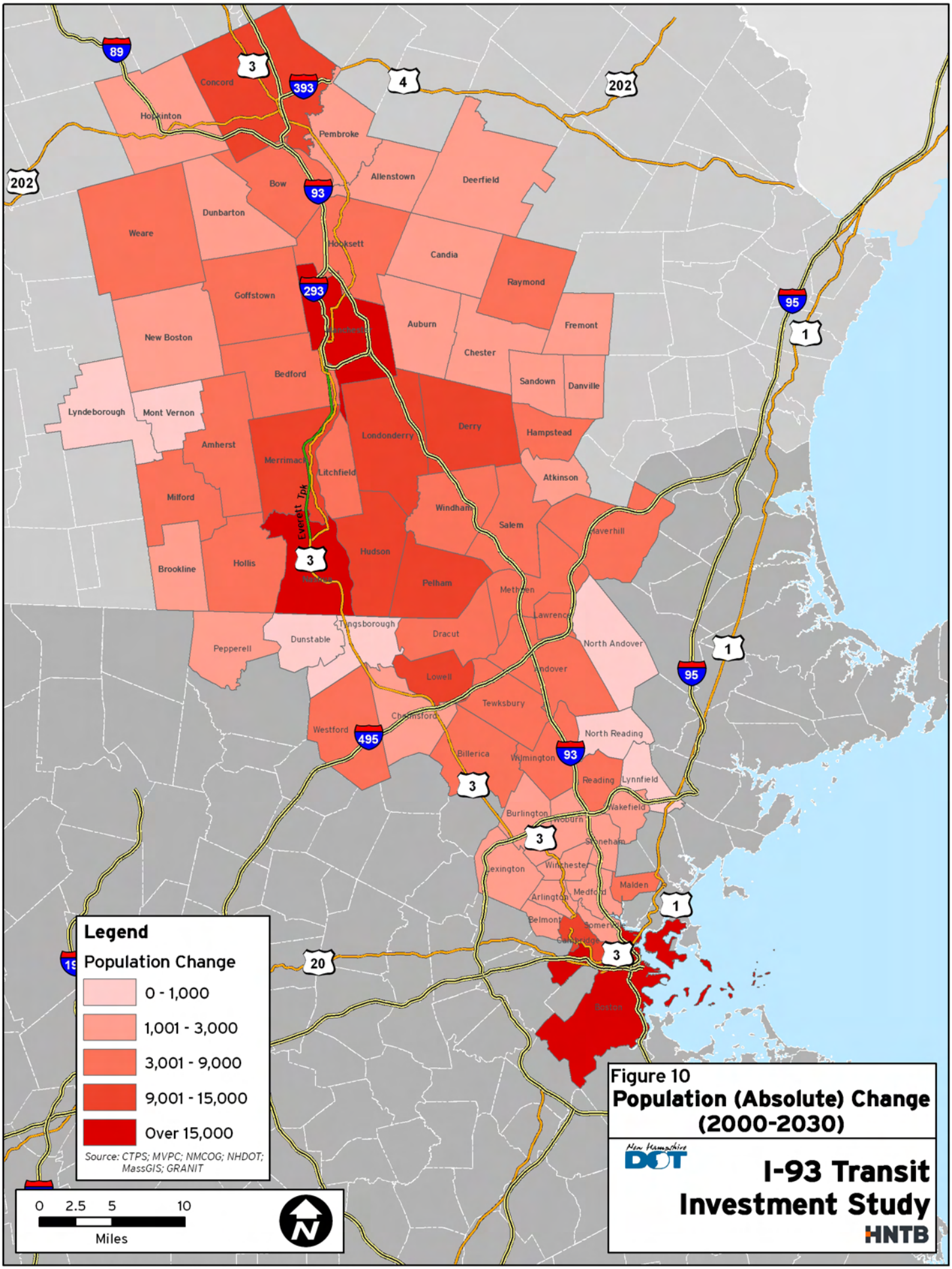

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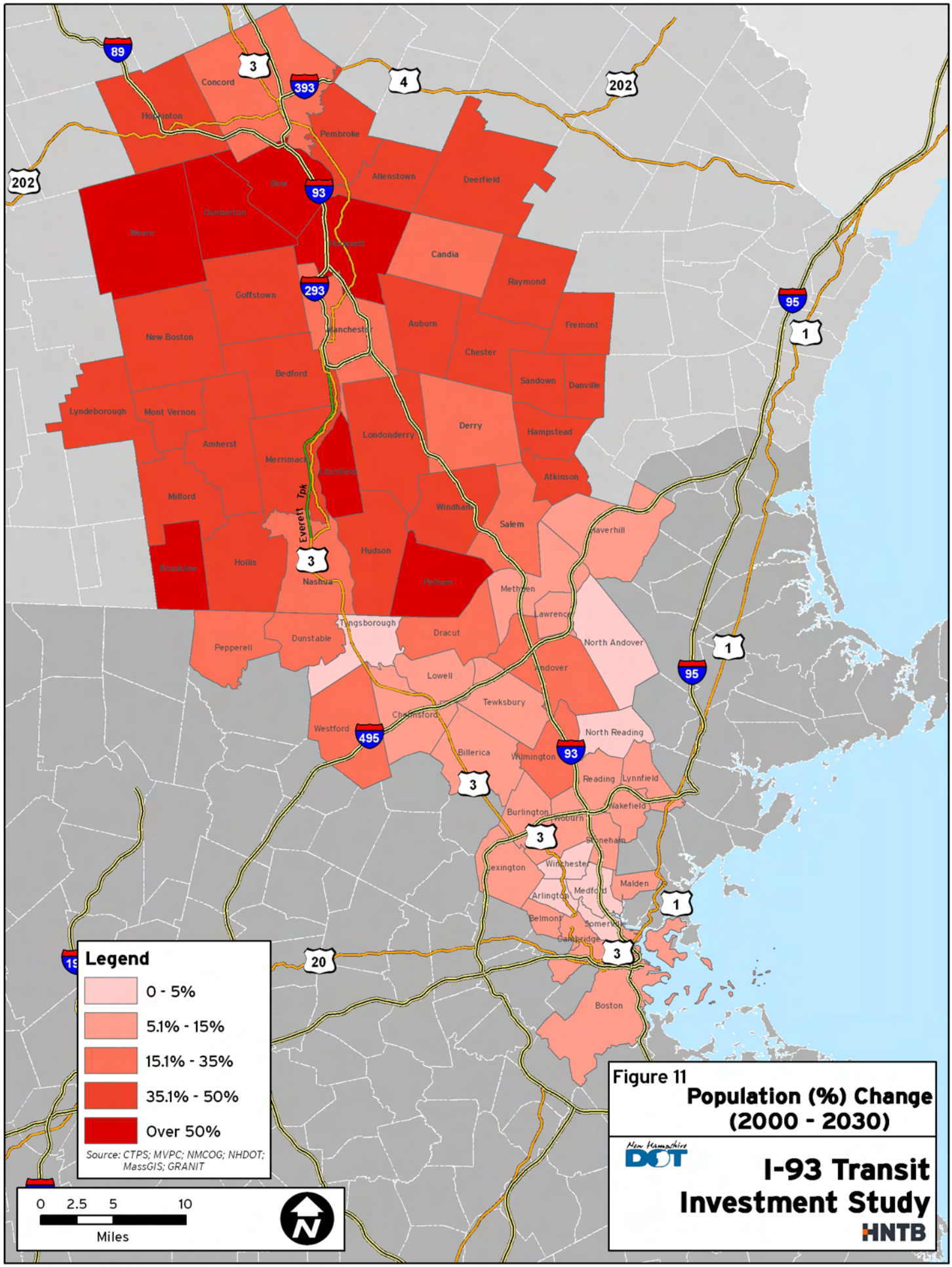

Legend
0 - 5%
5.1% - 15%
15.1% - 35%
35.1% - 50%
Over 50%
Source: CTPS; MVPC; NMCOG; NHDOT; MassGIS; GRANIT
0 2.5 5 10
Miles
Figure 11
Population (%) Change (2000 - 2030)
I-93 Transit Investment Study
HNTB
Concord
Pembroke
Allenstown
Deerfield
Candia
Raymond
Fremont
Auburn
Chester
Sandown
Danville
Hampstead
Derry
Londonderry
Manchester
Goffstown
New Boston
Bedford
Lyndeborough
Mont Vernon
Amherst
Merrimack
Milford
Hollis
Brookline
Nashua
Hudson
Pelham
Windham
Salem
Atkinson
Haverhill
Methuen
Lawrence
North Andover
Andover
Tewksbury
Dracut
Tyngsborough
Dunstable
Pepperell
Lowell
Chelmsford
Westford
Billerica
Wilmington
North Reading
Reading
Lynnfield
Wakefield
Burlington
Woburn
Stoneham
Winchester
Lexington
Arlington
Medford
Malden
Belmont
Somerville
Cambridge
Boston
Everett Tpk

The largest population increases from 2000 to 2030 in Massachusetts are expected to occur in Boston (38,957), Cambridge (14,575), Lowell (9.534), Lawrence (6,386), and Andover (5,388). In New Hampshire, the largest population increases are expected to occur in Manchester (23,394), Nashua (17,553), Concord (13,534), Merrimack (11,014), and Londonderry (9,589). As with historic population gains, the highest population gains are expected to occur in the Boston Central Business District or communities along the I-93 and U.S. Route 3 corridors.

According to *Vital Signs 2006: Economic and Social Indicators for New Hampshire, 2001-2004* (January 2006), prepared by the New Hampshire Economic and Labor Market Information Bureau, the majority of people relocating into New Hampshire come from Massachusetts. From 2000 to 2003, Rockingham County accommodated 7,300 new residents, Merrimack County accommodated 5,300 new residents, and Hillsborough County accommodated 2,400 new residents from Massachusetts. According to a study done by Mass Inc., in December 2003 only about 28 percent of new residents kept their jobs in Massachusetts. The majority found new jobs in New Hampshire and relocated due to the high cost of living.

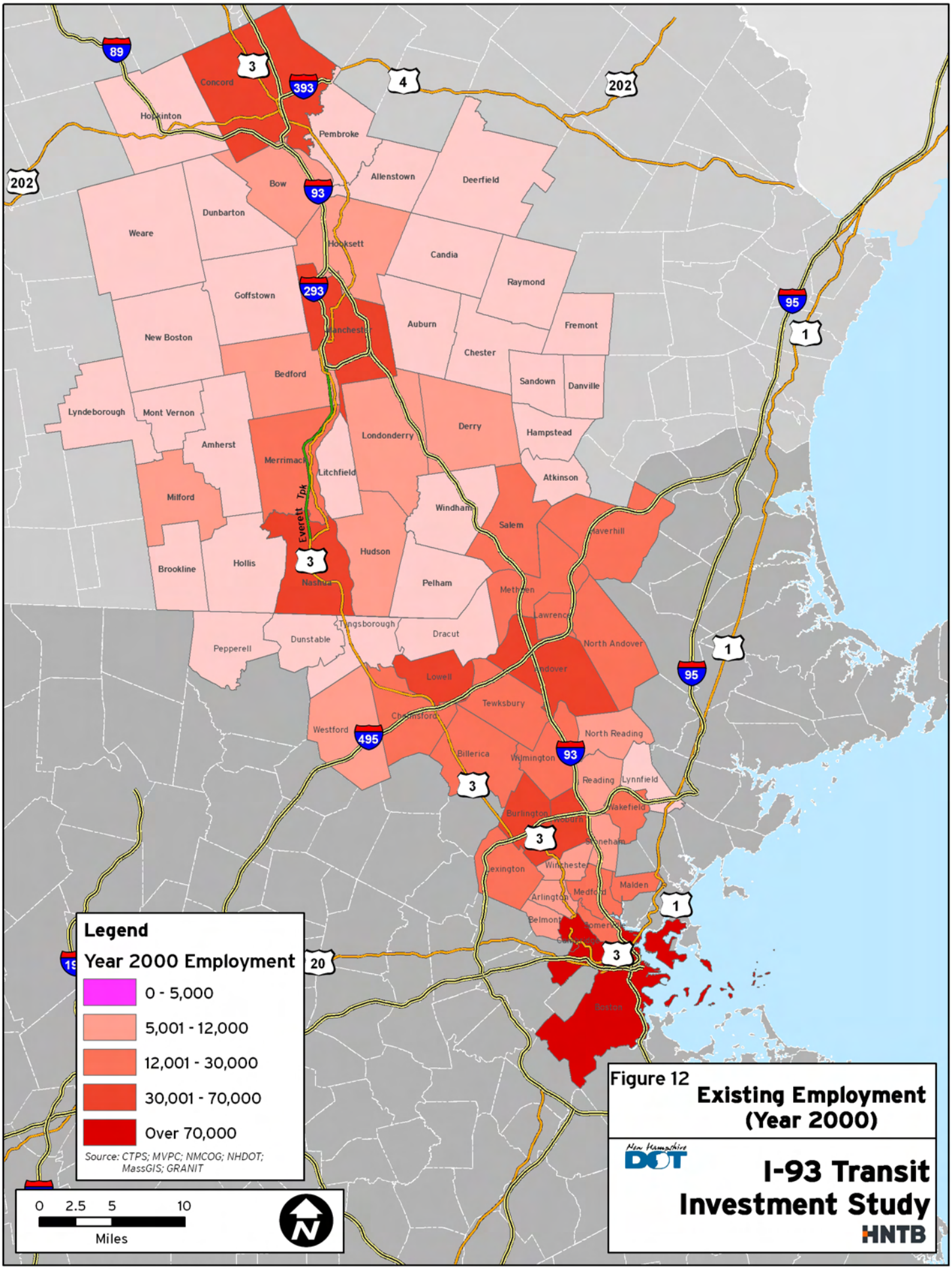
2. Employment Trends

Year 2000 employment levels were highest in urbanized areas of Boston and outlying Massachusetts communities (Figure 12). In Massachusetts, eastern Massachusetts dominates the state's economy and employment. In New Hampshire, concentrated areas of employment occur in urban centers of Nashua, Manchester, and Concord, which, combined, provided over 170,000 jobs in 2000.

Employment growth figures within New Hampshire were cited in the growth management planning booklet, CTAP Resource Book 2, *Technical Assistance and Resource Identification*, developed by NHDOT for I-93 communities. Over the past ten years, New Hampshire has, on average, added about 10,000 jobs per year.

The *Commonwealth of Massachusetts Long-Range Transportation Plan* (2006) cites job growth over the last decade that has increased by roughly 34,000 jobs per year. The Long Range Plan cites forecasted employment that is expected to grow by 13,000 jobs per year, or 9.5 percent, from 2000. The plan notes that the state has lost 4.3 percent of its jobs between 2000 and 2004 as reported by the Massachusetts Department of Labor and Workforce Development (from 3,245,653 to 3,106,680), but that, with an improving economy, job growth is expected to resume, but at a reduced rate from previous decades. The plan states that growth in the resident labor force after 2010 will be minimal, and notes that an increase in the net number of out-of-state commuters will be expected to provide some of the labor force growth.

The Massachusetts Long-Range Transportation Plan states that employment sites are expected to remain concentrated in areas surrounding metropolitan Boston, with new employment centers extending along the major transportation corridors leading into New Hampshire and Rhode Island.



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Massachusetts study area communities are expected to add roughly 111,000 jobs by 2030, or approximately 3,700 jobs a year (Figures 13, 14, 15, and 16). This compares to approximately 135,000 new jobs created in New Hampshire study area communities over the same time period, or roughly 4,500 jobs a year. These represent employment increases of about 10% in Massachusetts study area communities and 48% in New Hampshire study area communities.

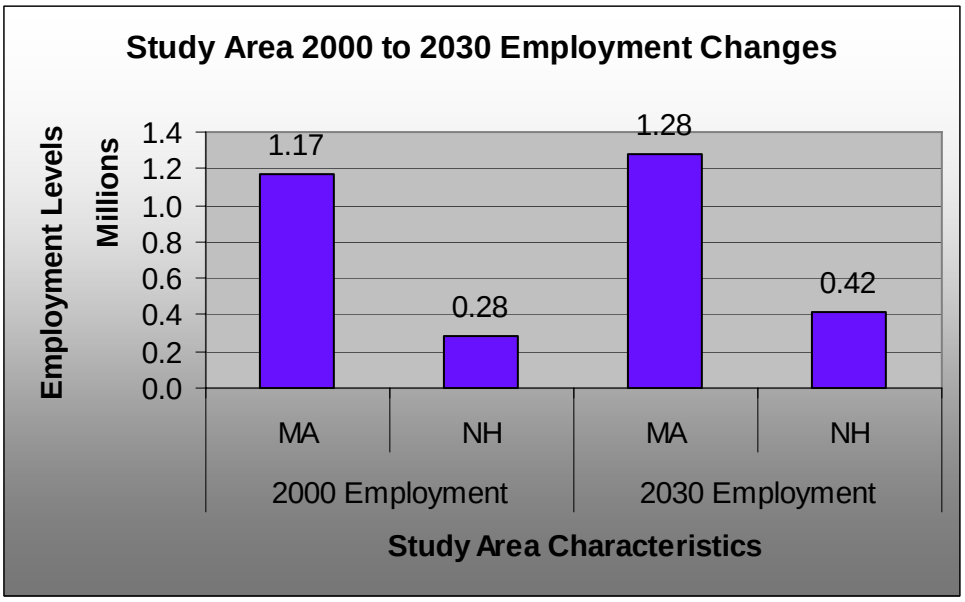
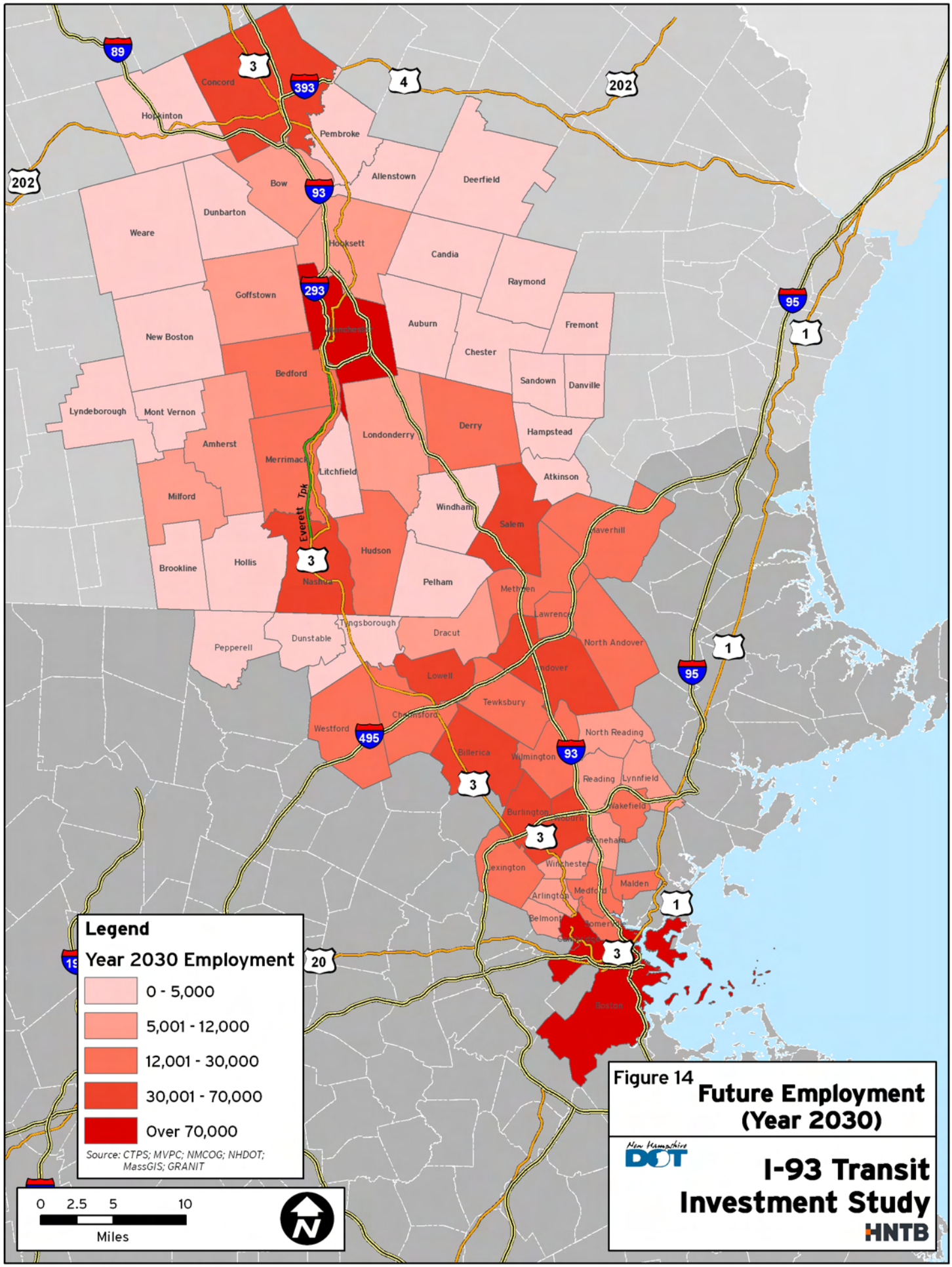


Figure 13-Study Area 2000 to 2030 Employment

The highest employment increases in Massachusetts are expected to occur in Boston (50,550), Cambridge (9,437), Woburn (7,479), Burlington (5,722), Andover (4,884), and Billerica (4,835). In New Hampshire, the highest employment increases are expected to occur in Manchester (35,716), Concord (20,338), Nashua (16,164), and Salem (12,120). Again, those communities with the highest projected employment increases are the Boston Central Business District or are communities predominantly located along the I-93 or U.S. Route 3/F.E. Everett Turnpike corridors.

According to the New Hampshire Economic and Labor Information Bureau, Rockingham County is projected to be one of the fastest-growing counties in terms of new jobs over the next decade. Employment growth in Hillsborough County is projected to be the fourth highest of all ten counties in New Hampshire. Employment growth in Merrimack County is expected to be close to that for the state as a whole.



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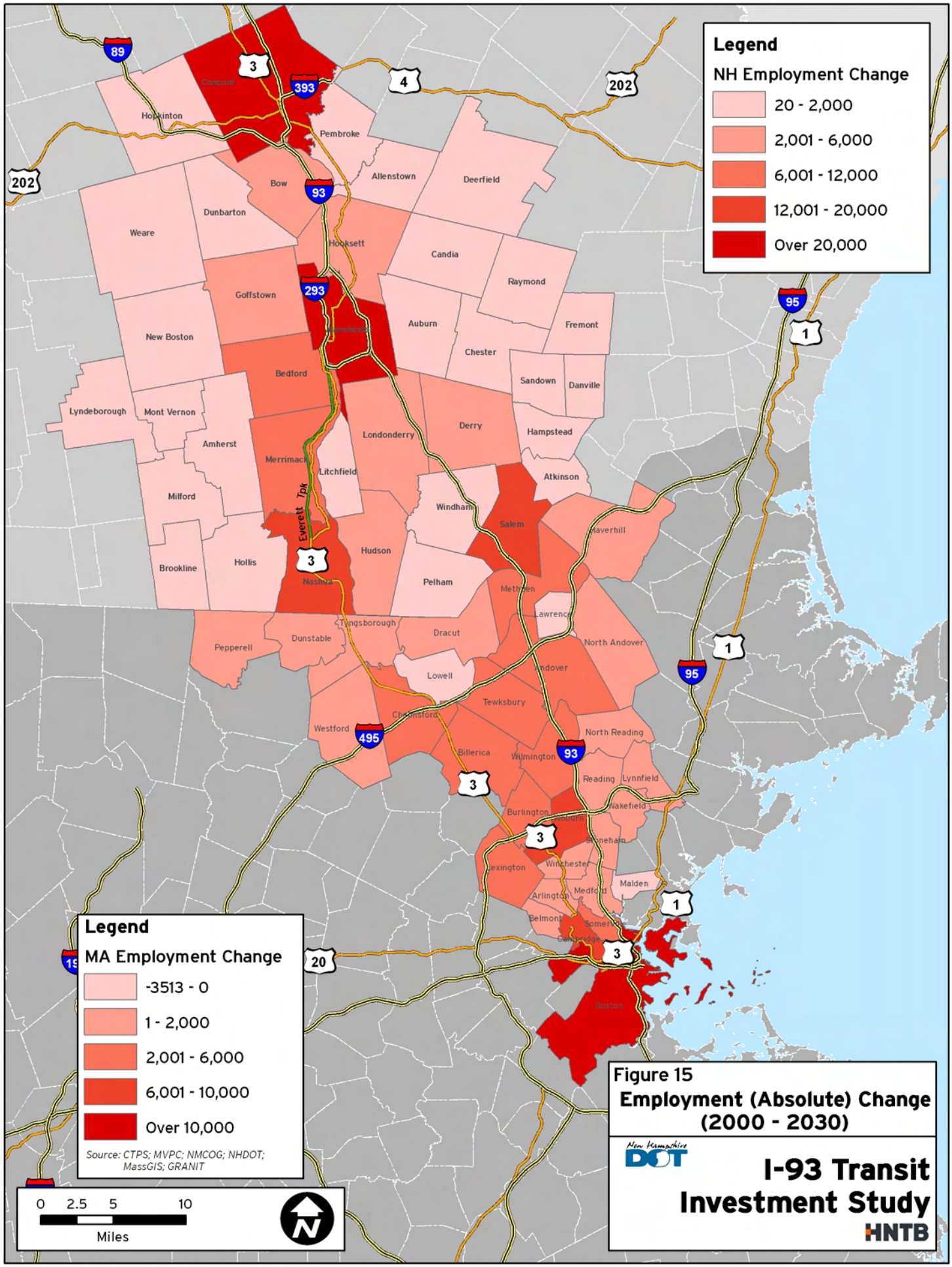
Legend
NH Employment Change
20 - 2,000
2,001 - 6,000
6,001 - 12,000
12,001 - 20,000
Over 20,000
Legend
MA Employment Change
-3513 - 0
1 - 2,000
2,001 - 6,000
6,001 - 10,000
Over 10,000
Source: CTPS; MVPC; NMCOG; NHDOT; MassGIS; GRANIT
0 2.5 5 10
Miles
Figure 15
Employment (Absolute) Change (2000 - 2030)
I-93 Transit Investment Study
HNTB
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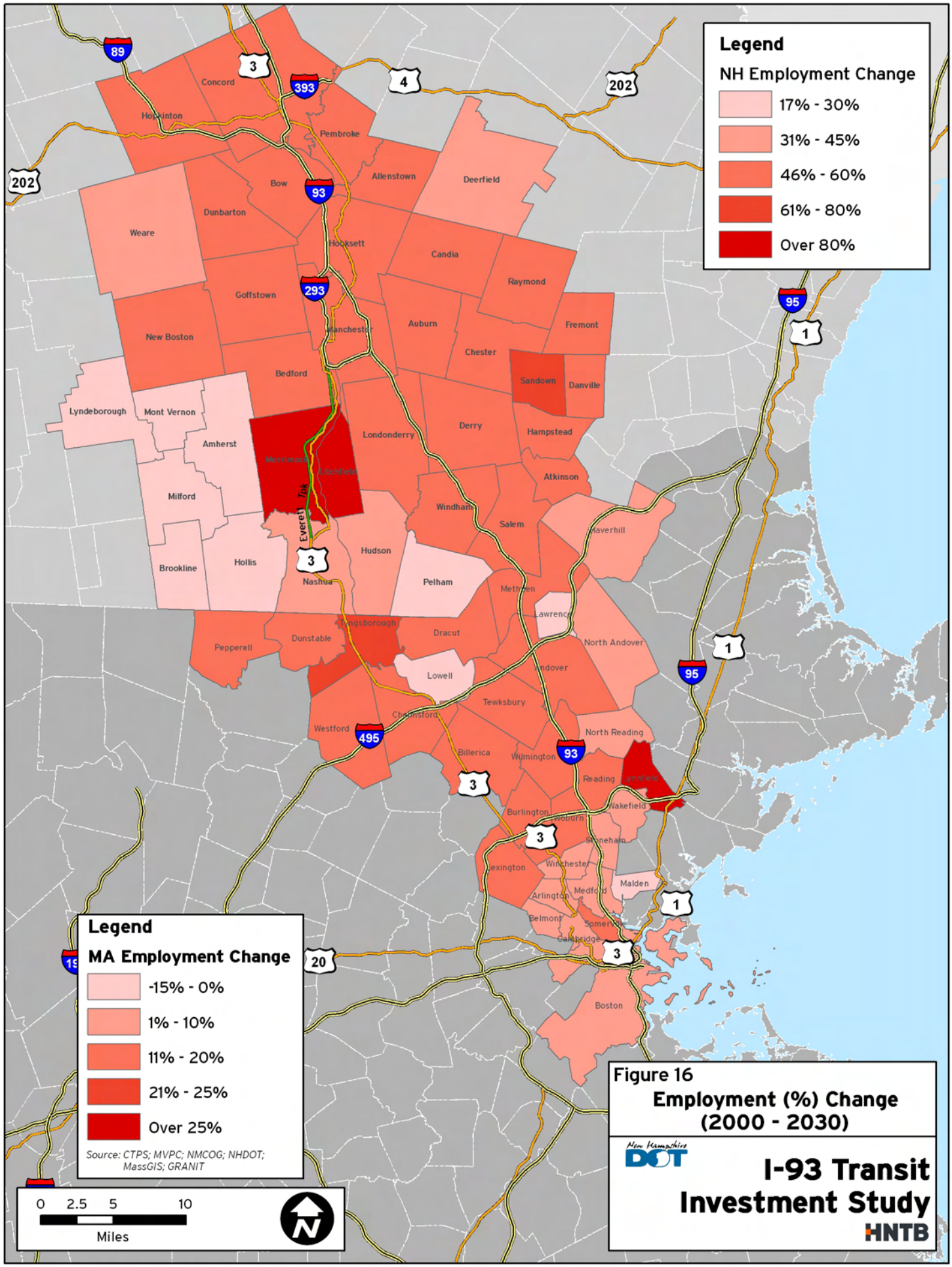

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Journey to work statistics indicate that commute trips are getting longer as workers move further away from job centers. Another factor is that jobs are no longer clustered in core urban areas, but continue to be dispersed throughout the region, as shown in Figure 17. Table 1 shows the communities within each of the regional planning areas shown in the figure.

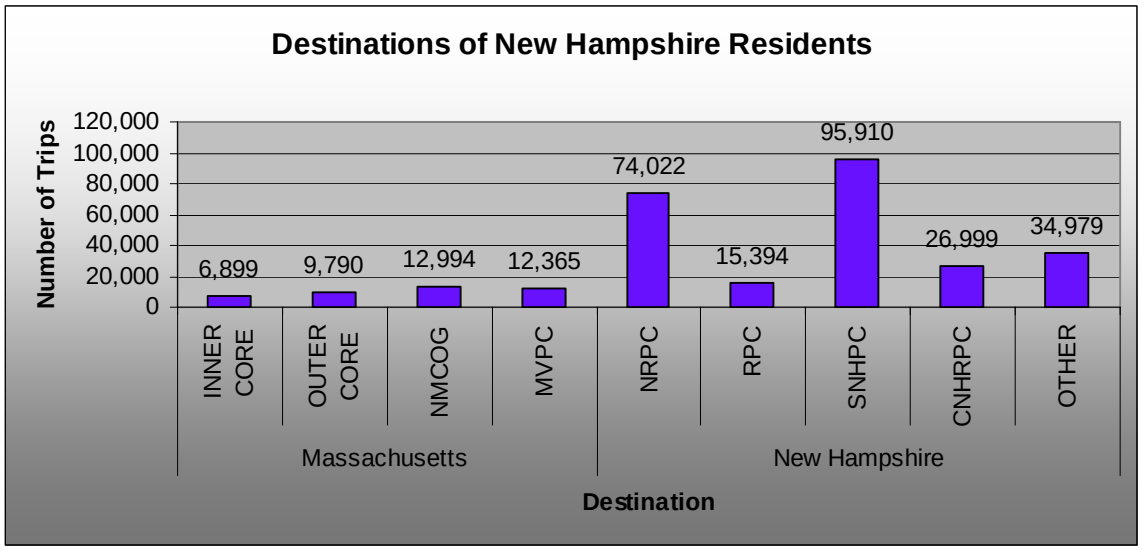


Figure 17-Chart of Work Trip Destinations for New Hampshire Residents

B. Existing Transportation System

1. Existing Highway Network

Principal north-south highways in the study area are I-93 and U.S. Route 3 and the F. E. Everett Turnpike. I-93 was constructed in the early 1960s, when it was expected to carry 20,000 vehicles per day within its design life of 20 years. In 1997, traffic volumes in Salem, north of the Massachusetts border, were exceeding 100,000 vehicles per day. Since I-93 was constructed, traffic volumes have increased by 600 percent in Salem, New Hampshire at the border with Massachusetts. Between 1970 and 1990, traffic on U.S. Route 3 increased by 300 percent at the state border. By the late 1990s, U.S. Route 3 was experiencing severe congestion along its entire length.

Traffic congestion and serious safety concerns on these highways have led to the demand for highway capacity improvements. Widening of I-93 has been, or is under study, in both New Hampshire and Massachusetts. In 1999, construction started on widening U.S. Route 3 in

Massachusetts from two to three lanes in each direction over a distance of roughly 21 miles between I-95 (Route 128) and the New Hampshire state line. Route 3/F.E. Everett Turnpike in New Hampshire has also been reconstructed in recent years.

Table 3 displays existing traffic volumes on I-93, U.S. Route 3/F.E. Everett Highway, and major circumferential highways in Massachusetts (I-495 and I-95 (Route 128)) that also provide access to New Hampshire and points to the north. A more detailed description of these highways and other north-south highways (Route 1 and Route 28) is provided below.

a. I-93

Average daily traffic has grown steadily in the I-93 corridor. Historic trends revealed a 5 percent annual growth rate in the average daily traffic for I-93 for the segment north of the metropolitan Boston area. The heaviest traffic volumes along I-93 occur in southbound traffic in the morning peak period and northbound in the evening peak period. Figures 18 and 19 display traffic growth over time on the Massachusetts and New Hampshire segments of I-93.

Peak hour traffic volumes reflect the commuter orientation of the corridor. In New Hampshire, approximately 60 percent of the traffic flow is southbound in the morning peak hour, and northbound in the evening peak hour. Analysis of the monthly variations in average daily traffic along the I-93 corridor indicates that the summer season has the highest traffic volume on a daily basis; August is the peak month with an average daily traffic volume of 77,500 vehicles per day.

In Massachusetts, during the morning and evening commuter periods, traffic speeds are reduced because of traffic congestion on I-93 and heavy exiting and entering volumes at some interchanges. In the southbound direction in the morning peak period, recurrent congestion occurs at Exit 45 (River Road in Andover), Exit 44 (I-495 in Andover) and Exit 42 (Dascomb Road in Tewksbury). Congestion is even heavier at these locations in the northbound evening commute.

Table 3-Existing Conditions-Highways

Average Daily Traffic

Highway	Vehicles Per Day (VPD)
I-93 – New Hampshire	
Manchester (between exits 8 and 5A)	71,000 - 101,000
Londonderry (between exits 5A and 5)	72,000 - 77,000
Windham (between exits 4 and 5)	73,000
Salem (between exits 3 and 1)	84,000 - 87,000

Table 3-Existing Conditions-Highways

Average Daily Traffic

	Vehicles Per Day (VPD)
I-93 – Massachusetts	
Methuen (between state line and exit 46)	101,100 - 126,900
Andover (between exits 45 and 41)	140,400 - 136,400
Wilmington (between exits 41 and 40)	154,900
Woburn (No. of I-95) (between exits 38 and 37)	163,200
Stoneham (between exits 36 and 33)	172,600 - 183,700
Medford (between exits 34 and 30)	166,000 - 177,900
Somerville (between exits 30 and 29)	130,300

Sources: Mass Highway (2004) and NH DOT (2003)

I-95 - Massachusetts	
East of I-93	
Lynnfield, Wakefield (between exits 43 and 39)	131,00 - 135,000
West of I-93	
Woburn, Burlington, Lexington (between exits 37 and 30)	154,300 - 174,200

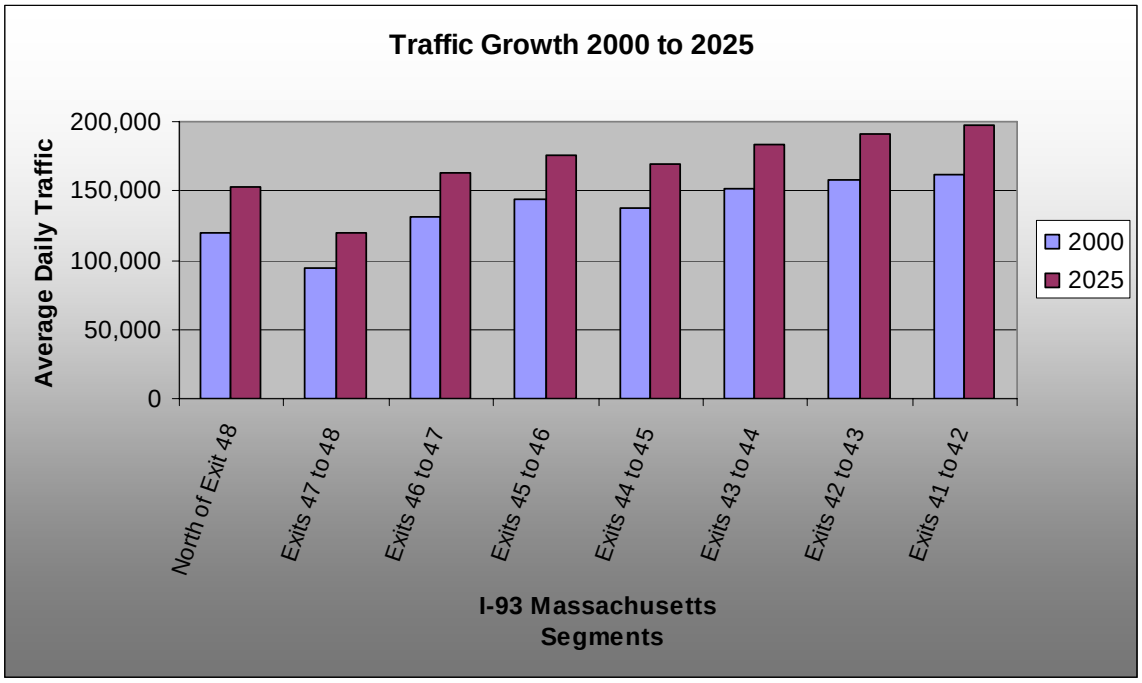
Source: MassHighway (2005)

Route 3/F.E. Everett Turnpike	
New Hampshire	
Bedford, Merrimack, Nashua (between Bedford Toll to state line)	47,000 - 101,000
Massachusetts	
Tyngsborough, Chelmsford, Billerica (between exits 37 and 28)	60,000 - 86,500

Source: MassHighway (2004) and NHDOT (2003)

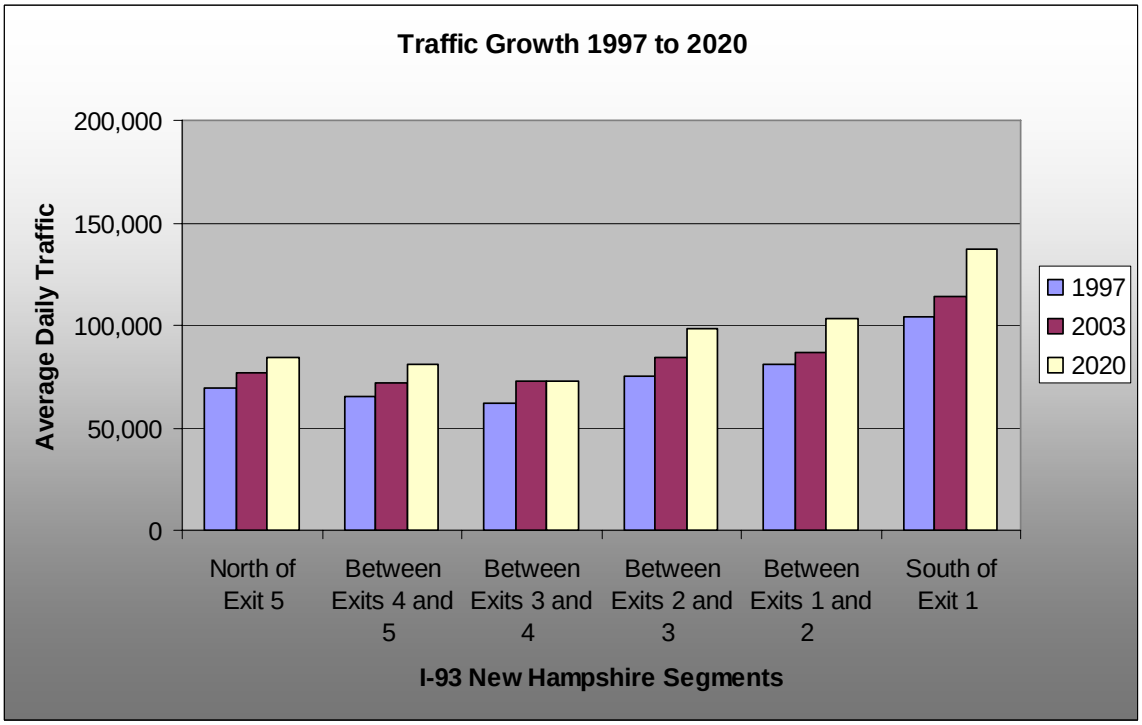
I-495 - Massachusetts	
North of I-93	
Haverhill, Methuen, Lawrence, Andover (between exits 50 and 40)	84,100 - 102,500
West of I-93	
Lowell, Chelmsford (between exits 37 and 33)	104,300 - 121,600

Source: MassHighway (2004)



Source: I-93 Corridor Traffic Study, Andover and Methuen, Massachusetts

Figure 18-Traffic Growth 2000 to 2025 on I-93 in Massachusetts



Source: I-93 Salem to Manchester Improvements FEIS

Figure 19-Traffic Growth 1997 to 2020 on I-93 in New Hampshire

Traffic volumes are much heavier at the southern end of the study area with approximately 160,000 vehicles per day (80,000 vpd in each direction) recorded in 2000 traveling between Exit 42 (Dascomb Road in Tewksbury) and Exit 41 (Route 125 in Wilmington) (see Figure 18) . Between Exit 48 (Route 213 in Methuen) and the New Hampshire state line, the 2000 traffic volume was lower, with approximately 120,000 vehicles per day (60,000 vpd in each direction).

According to MassHighway, heavy truck and other heavy vehicle traffic makes up approximately 6 percent of the overall traffic on I-93, with passenger vehicles and small trucks comprising the remaining volume. According to the *Regional Transportation Plan and Transportation Improvement Program* for the Southern New Hampshire Planning Commission (July 2004), trucks are critical for short and long distance hauling in New Hampshire. Due to its location at a junction of an interstate system (I-93 and I-293), Manchester is considered to be the hub of New Hampshire's motor freight industry. Truck freight carriers in southern New Hampshire are located in Manchester, Londonderry and Hooksett.

Operating Speeds

As part of the I-93 Improvements Salem to Manchester FEIS, a travel time and delay study was conducted along I-93 from the I-293 split in Manchester to the Massachusetts state line in April 2000. During the morning peak period in the southbound direction, the prevailing speeds are typically as follows:

Segment	Prevailing Speed
I-293 to Exit 5	60-70 mph
Exit 5 to Exit 4	55-65
Exit 4 to Exit 3	50-65
Exit 3 to Exit 2	40-50
Exit 2 to Exit 1	30-40
Exit 1 to the MA state line	55-65

During the morning peak period in the southbound direction, travel between I-293 and Exit 5 in New Hampshire is generally under free-flow conditions, with prevailing speeds of 60-70 mph. Congestion builds between Exit 3 and Exit 5, slowing travel speeds to 50-60 mph. More substantial congestion is experienced between Exit 3 and Exit 2, with travel speeds of 40-50 mph. The most substantial congestion is experienced approaching the Massachusetts border between Exit 2 and Exit 1, with travel speeds reduced to 30-40 mph. The wider cross-section between Exit 1 and the Massachusetts state line allows speeds to increase to 55-65 mph.

During the evening peak period in the northbound direction, travel speeds are typically as follows:

Segment	Prevailing Speed
State Line to Exit 1 (Route 28, Salem)	15-35 mph
Exit 1 to Exit 2 (Route 97, Salem	20-40
Exit 2 to Exit 3 (Route 111, Windham)	35-60
Exit 3 to Exit 4 (Route 102, Londonderry)	55-65
Exit 4 to Exit 5 (Route 28, Londonderry)	60-70
Exit 5, Exits 6/7 (Route 101/93, Manchester) to I-293	60-70

During the evening peak period in the northbound direction, substantial delays are experienced south of Exit 1, north of the Massachusetts state line, with travel speeds recorded at 15 to 35 mph. Between Exit 1 and Exit 2, substantial congestion continues to be experienced with only modest increases in travel speeds ranging from 20 mph to 40 mph. Somewhat improved travel speeds of 35 to 60 mph were recorded between Exit 2 and Exit 3. Travel speeds begin to increase north of Exit 3 and, north of Exit 4, can generally be described as free-flow conditions.

Traffic speeds in Massachusetts would be considerably slower, were it not for interim use of the breakdown lanes (shoulders) for general purpose travel during peak travel periods along approximately 10 miles of I-93.

Level of Service

Travel speed is a typical measure of highway performance. Traffic operations are defined according to traffic levels of service. The Highway Capacity Manual (HCM) defines level of service (LOS) on arterial roadways and freeways in terms of average speeds. For limited access highways such as I-93, LOS A, B, and C describe free-flow or greater than free-flow speeds. LOS D describes conditions in which speeds are beginning to decrease but are still considered acceptable, and LOS E describes travel conditions at capacity. LOS F describes severely congested traffic flow.

For 1997 peak hour traffic flow, the analysis of operating conditions shows poor level of service on the New Hampshire segment from Exit 1 (Route 28 in Salem) to Exit 3 (Route 111 in Windham). This congestion associated with inadequate main line capacity between Exits 1 and 3 also extends to interchange traffic operations. During the morning peak hour, severe congestion occurs at the:

- Exit 1 southbound off- and on-ramps (LOS F),
- Exit 2 (Route 97, Salem) southbound off- and on-ramps (LOS F),
- Exit 3 southbound on-ramp (LOS F), and
- Exit 3 southbound off-ramp (LOS E).

During the evening peak hour, interchange capacity is exceeded (LOS F) at the:

- Exit 1 northbound on-ramp,
- Exit 2 northbound on- and off-ramps, and

- Exit 3 northbound off-ramp.

During the morning peak hour, the existing configuration in Massachusetts of three travel lanes in each direction is insufficient to accommodate the existing traffic volumes. The segment of I-93 between Exit 45 (River Road in Andover) and Exit 42 (Dascomb Road in Tewksbury) would operate at an unacceptable level of service (LOS E or F) if the shoulder was not being used as a travel lane as an interim congestion relief measure. Shoulder lane use during peak periods is allowed on the highway segment that extends north of Route 125 in Wilmington, where the roadway narrows from eight lanes to six lanes, to Exit 47 (Pelham Street in Methuen). It is important to note that shoulders are considered to be a buffer or reserved area between the main thoroughfare and the edge of the road. Shoulders are usually only used by motorists in the event of an emergency or by emergency vehicles in order to bypass traffic. In this section of I-93, cars are permitted to use shoulders as normal use lanes in the morning and evening peak hours. However, there are safety issues with using shoulders for travel lanes such as inadequate merging characteristics and high speeds.

Safety

Crash data for I-93 was obtained from the NHDOT, based on the information provided by the New Hampshire Department of Safety (NHDOS), for the period from January 1995 to December 2002. Over this seven-year period, a total of 2,427 crashes were reported for the portion of I-93 from Exit 1 to Exit 5 in New Hampshire. Of the total number of crashes, 29 percent involved personal injury, while 70 percent were limited to property damage. The highest number of crashes was recorded between Exit 3 and Exit 4, with 675 crashes or 28 percent.

Crash data for the 10-mile section of I-93 in Massachusetts were reviewed for the most recent three-year period available in the I-93 Corridor Study (1997-99), Andover and Methuen, Massachusetts. According to the crash data collected by MHD, there were 1,587 accidents along I-93 during the three-year study period. Of that total, 970 crashes, or 61percent, occurred at interchanges.

b. I-293

I-293 provides an east-west connection between I-93 and the F.E. Everett Turnpike in Manchester. This 11-mile route also provides a south and west bypass of Manchester. According to traffic data compiled by the SNHPC, traffic volumes on I-293 were among the highest in the region. I-293 and U.S. 3/NH28 in Manchester are currently operating at, or over, capacity during peak hour periods.[1]

[1] 2004 Regional Transportation Plan and Transportation Improvement Program 2005-2007 prepared by the Southern New Hampshire Planning Commission.

c. U.S. Route 3/F.E. Everett Turnpike

U.S. Route 3 is the other major north-south principal arterial that extends from southern New Hampshire through the metropolitan Boston area. Located west of I-93, Route 3 provides access to Burlington, Billerica, Chelmsford, and Tyngsborough in Massachusetts, and Nashua, Merrimack and Manchester in New Hampshire. Park and ride facilities are located off Route 3 in Nashua and north of Nashua. Route 3 and the F.E. Everett Turnpike run concurrently up to Exit 7 in Nashua where the two roads diverge and generally run parallel to each other. F.E. Turnpike continues as a toll road and Route 3 as a U.S. Route. Route 3 continues to Maine whereas the F.E. Turnpike ends at the confluence of Routes 101 and I-293 in Manchester

Predominant traffic flows mirror commuting patterns on I-93, with heavier southbound flows in the morning peak period and heavier northbound traffic in the evening peak period. Data collected prior to the Massachusetts Route 3 project indicated that southbound traffic experienced severe congestion (LOS E and F) during the a.m. peak period, and northbound traffic was congested during the p.m. peak period. As shown in Table 3, the number of vehicles per day ranges from 47,000 at the Bedford Toll in New Hampshire to 101,000 in Nashua between Exits 4 and 5.

d. Route 28

Roughly paralleling I-93 to the east in the study area, Route 28 is a north-south connector linking Pembroke, Suncook with Manchester and Salem in New Hampshire. In Massachusetts, Route 28 continues running parallel to and on the east side of I-93, traveling through the town centers of Methuen, Lawrence, Andover, North Reading, Reading, and Stoneham. Route 28 crosses major highways in the study area including I-95 (Route 128) in Reading and I-495 in Andover. The primary function of Route 28 is to carry through traffic and provide access to abutting properties and collector streets. South of Stoneham, Route 28 traverses through Medford and Somerville prior to crossing the Charles River into Boston.

e. Route I-495

As a limited access circumferential interstate highway, I-495 carries traffic in an arc approximately 30 miles outside of Boston from Salisbury, Massachusetts at its northern terminus to Wareham, Massachusetts at its southern terminus. Along its route, I-495 intersects eight major radial expressways including I-93, Route 3, Route 2, I-290, and I-90 (Massachusetts Turnpike), Route 24, and I-95.

I-495 experiences acceptable conditions both northbound and southbound during the a.m. and

p.m. peak periods with travel speeds of 50 mph or above.[2] In the study area, the average daily traffic on I-495 ranges from more than 84,000 in Haverhill to more than 121,000 in Lowell.

f. I-95

Inside the I-495 arc, I-95 (Route 128) forms a partial inner beltway around the metropolitan Boston area. On the east, where it splits from Route 128, I-95 transitions to a north–south interstate freeway providing access from Peabody, Massachusetts to points in New Hampshire and Maine. In the study area, I-95 connects with five radial roadways: I-90 (Massachusetts Turnpike) in Weston, Route 2 in Lexington, Route 3 in Burlington, I-93 in Reading and Route 1 in Lynnfield.

The I-93/I-95 interchange has been listed as one of the highest crash locations on the Top 25 Crash Locations in the Boston Metropolitan Planning Organization Region (1997-1999). During the morning and evening peak periods, I-95 experiences heavy congestion and mobility problems, which increase with proximity to downtown Boston. In the study area, average daily traffic ranges from 132,100 vehicles per day in Lynnfield to 174,200 vehicles in Woburn, as shown on Table 3. Historic trends in volume to capacity ratios for Boston area roadways indicate the increasing daily traffic volume and congestion on I-95.[3]

g. Route 1

In the study area, Route 1 is an arterial roadway providing north-south access on the east side of the study corridor. In 1999 and 2000, the Central Transportation Planning Staff (CTPS) conducted a speed and travel time study on limited access highways in the Boston metropolitan region. The analysis for the I-93 northbound off-ramp to I-93/Route 1 merge showed that for the southbound a.m. peak period, the average speed was 7 mph with a LOS F. For the northbound p.m. peak period, the I-93 to Route 1 Interchange also experienced a LOS F with an average speed of 32 mph.

2. Travel Patterns

For a balanced analysis, the I-93 Transit Investment Study is sectioned into eight (8) Districts. The Districts are named after the Regional Planning Commission they are situated in, but do not encompass the entire area. As indicated in Table 1, four (4) Districts are in New Hampshire and

[2] Northern Middlesex Council of Governments/Northern Middlesex Metropolitan MPO, Congestion Management Systems Report, April 2006.
[3] A Framework for Thinking: A Plan for Action, Massachusetts Executive Office of Transportation, Draft Report - May 2005.

four (4) are in Massachusetts. A total of sixty-nine (69) cities and towns comprise the entire study area (see Table 1). Travel patterns in the study area show that most work- based travel is local, as one would expect. The largest trip generation districts in New Hampshire are the Nashua region and the Southern Districts (Figure 4). These two regions are also the destination of the largest percentage of trips. Of note in the trip and transit distribution shown in Table 4, is that although the percentage of trips from NH districts to the Boston Inner Core is only 2% of all trips, it also has the highest percentage of transit mode share at 11%. This indicates that importance of transit in accommodating these longer work trips that are being made between New Hampshire and the Boston Inner Core.

3. Proposed Railroad Corridors

Along the West Rail Corridor, the Boston and Maine Corporation, a wholly owned subsidiary of the Guilford Railroad System (Pan Am Railways) owns the New Hampshire portion of the right-of-way (New Hampshire Main Line) and the MBTA (Lowell Line) owns the right-of-way in Massachusetts.

The railroad right-of-way for the East Rail Corridor along the M&L Branch is largely owned by the State of New Hampshire, with a few exceptions, and the MBTA owns the right-of-way (Haverhill Line/B&M West Route Main Line) within Massachusetts. The I-93 Salem to Manchester Improvements FEIS indicated that portions of the right-of-way in Derry are owned by the town and that private interests own portions of the right-of-way in Derry and Londonderry. The Manchester Airport Authority acquired 5.8 miles for the Manchester-Boston Regional Airport, but sold portions to the state, retaining 2.2 miles from Harvey Road to Goffs Falls Road.

An I-93 Transit Corridor would be situated largely within the highway right-of-way owned by the State of New Hampshire. In New Hampshire, the I-93 highway right-of-way varies from about 150 to 500 feet in width. The median width is typically 70 feet or more, although in some areas it narrows to 30 feet. A potential rail corridor could be accommodated largely within the median in New Hampshire, crossing to the outer edge of the highway approaching the state line. In Massachusetts, the median width is narrower, and this potential rail corridor could either continue within the highway right-of-way (to the west or east of the highway corridor) to the Anderson Transportation Center on the Lowell Line or would involve connections to the M&L Branch.

Table 4-Characteristics of Travel between areas within Study Corridor

TOTAL TRIPS

To:	INNER CORE	OUTER CORE	NMCOG	MVPC	NRPC	RPC	SNHPC	CNHRPC	OTHER	Grand Total
From:										
NRPC	2,382	4,269	8,992	2,391	55,828	1,660	11,522	841	9,942	97,827
RPC	1,412	2,234	1,697	6,150	1,510	8,389	3,163	175	8,849	33,579
SNHPC	2,842	3,182	2,166	3,758	15,433	5,155	75,090	5,125	12,449	125,200
CNHRPC	257	102	137	66	1,246	194	6,113	20,866	3,733	32,714
Grand Total	6,893	9,787	12,992	12,365	74,017	15,398	95,888	27,007	34,973	289,320

SHARES OF TRIPS

To:	INNER CORE	OUTER CORE	NMCOG	MVPC	NRPC	RPC	SNHPC	CNHRPC	OTHER	Grand Total
From:										
NRPC	2%	4%	9%	2%	57%	2%	12%	1%	10%	100%
RPC	4%	7%	5%	18%	4%	25%	9%	1%	26%	100%
SNHPC	2%	3%	2%	3%	12%	4%	60%	4%	10%	100%
CNHRPC	1%	0%	0%	0%	4%	1%	19%	64%	11%	100%
Grand Total	2%	3%	4%	4%	26%	5%	33%	9%	12%	100%

TRANSIT TRIPS

To:	INNER CORE	OUTER CORE	NMCOG	MVPC	NRPC	RPC	SNHPC	CNHRPC	OTHER	Grand Total
From:										
NRPC	233	11	13	0	273	7	29	0	56	622
RPC	90	0	0	0	0	0	0	0	23	113
SNHPC	393	21	0	0	14	12	471	31	97	1,039
CNHRPC	58	0	0	0	0	6	20	57	36	177
Grand Total	774	32	13	0	287	25	520	88	212	1,951

TRANSIT SHARE OF TOTAL TRIPS

To:	INNER CORE	OUTER CORE	NMCOG	MVPC	NRPC	RPC	SNHPC	CNHRPC	OTHER	Grand Total
From:										
NRPC	10%	0%	0%	0%	0%	0%	0%	0%	1%	100%
RPC	6%	0%	0%	0%	0%	0%	0%	0%	0%	100%
SNHPC	14%	1%	0%	0%	0%	0%	1%	1%	1%	100%
CNHRPC	23%	0%	0%	0%	0%	3%	0%	0%	1%	100%
Grand Total	11%	0%	0%	0%	0%	0%	1%	0%	1%	100%

Source: U.S. Census, Journey to Work, 2000

4. Existing Rail Passenger Services

a. MBTA Commuter Rail

In Massachusetts, commuter rail services currently include MBTA service from Boston that operates along the Haverhill Line, and service along the Lowell Line, on the west. Regional commuter rail services in Massachusetts operated by the MBTA do not extend to the state line and terminate at least 2 to 5 miles south of the New Hampshire border. Since 1997, average daily inbound boardings on the Haverhill and Lowell Lines have steadily increased (Figure 20).

The highest increases in boardings between 1997 and 2006 were generally recorded at the northern, outer stations: Haverhill, Andover, and Lawrence on the Haverhill Line and Lowell and North Billerica on the Lowell Line.

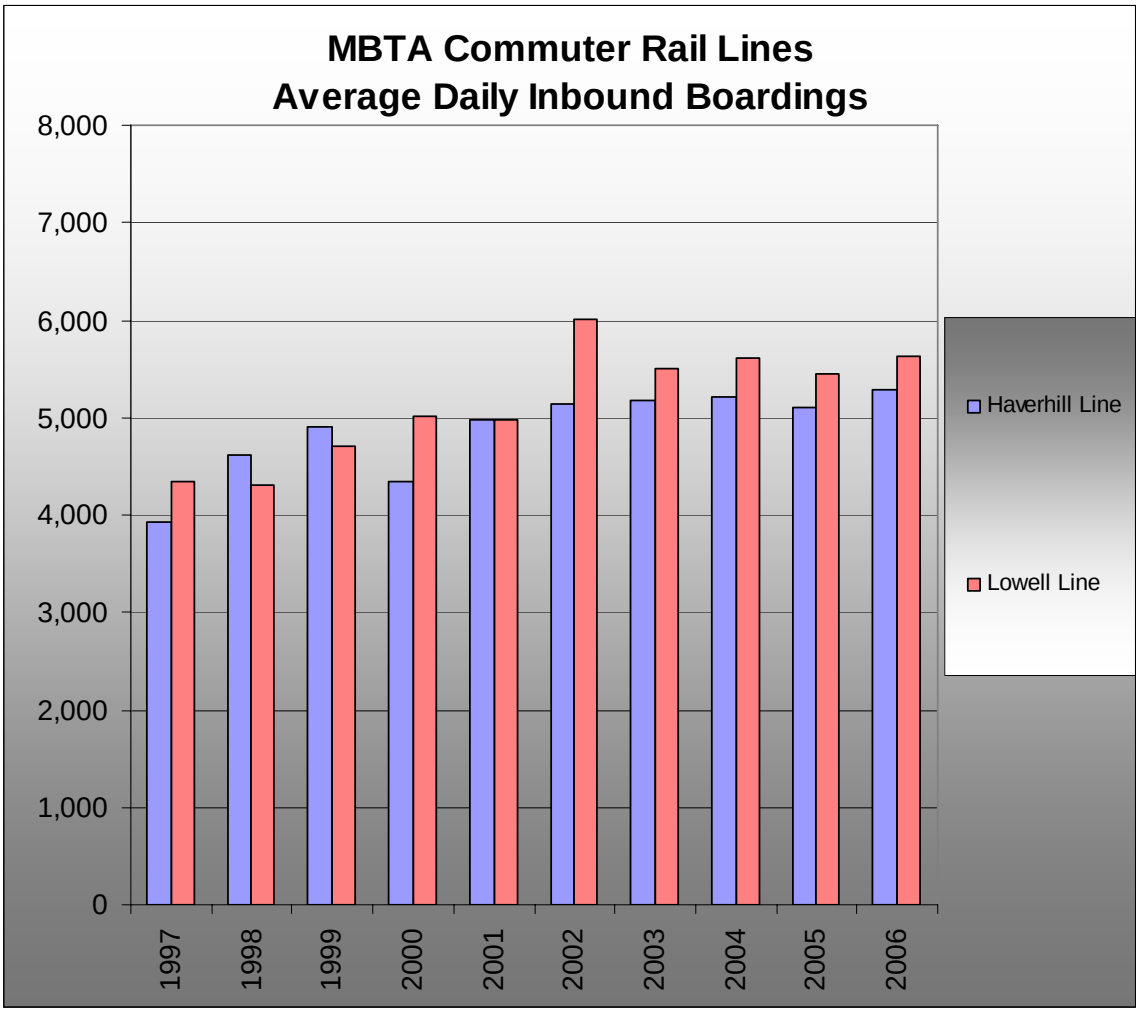


Figure 20-MBTA Daily Inbound Boardings on Haverhill and Lowell Lines (1997 to 2006)
Source: Ridership and Service Statistics, MBTA

According to the *Major Investment Study for Passenger Rail Service*, ninety percent (90%) of riders in New Hampshire live in the Nashua Regional Planning Commission area. Approximately six percent (6%) of the New Hampshire total originate from Manchester or the remainder of the Southern New Hampshire Regional Planning Commission area. Access to the Lowell line from the Manchester area is relatively poor; an estimated two percent (2%) of Manchester area commuters take the train from Lowell to Boston.

Evaluation of ridership along the Lowell Line at stations sites in Lowell and North Billerica performed for the *Major Investment Study* indicated that the increase in ridership over a 10-year period among New Hampshire residents (185 additional riders) was nearly as high as that for Massachusetts residents (208 riders). The ridership among New Hampshire residents increased by 80% between 1988 and 1998, compared to a 15% growth rate among Massachusetts residents. The increase in the number of Nashua residents was even higher over this time period and increased by 133%. Of the work trips reported in these ridership surveys, 89% were commuters into Boston. Over 96% of the New Hampshire residents stated that they would prefer to board in New Hampshire.

Additionally, a study conducted by the University of New Hampshire in February 2007, found overwhelming demand for passenger rail service into southern New Hampshire. The study concluded that nearly nine out of ten New Hampshire adults (87%) favor extending rail service into New Hampshire.

Haverhill Line

Service on the Haverhill Line operates primarily over the West Route Main Line (WRML) tracks between North Station and downtown Haverhill. This route, which is approximately 33 miles in length, and includes 14 stations. These stations are located at: North Station, Malden Center, Wyoming Hill (Melrose), Melrose/Cedar Park, Melrose Highlands, Greenwood (Wakefield), Wakefield, Reading, North Wilmington, Ballardvale (Andover), Andover, Lawrence, Bradford (Haverhill), and Haverhill.

The MBTA operates 46 trains (23 inbound and 23 outbound) on the Haverhill Line service on a typical weekday. Eighteen of the 46 trains operate only to/from Reading Station, two trains originate/terminate in Andover, and the remaining 24 of the 46 trains originate/terminate in Haverhill. Of the 46 trains, four are express trains, which operate along the New Hampshire Main Line and the Wildcat Branch, before connecting with the WRML serving the stations north of North Wilmington Station. The express trains do not stop at Reading, Wakefield, Greenwood, Melrose Highlands, Melrose/Cedar Park, Wyoming Hill and Malden Center stations.

Connections to other MBTA rail services can be made at North Station and Malden Center Station. Connections to both the MBTA Orange Line and the MBTA Green Line can be made at North Station. A connection to the MBTA's Orange Line can be made at Malden Center. During

the morning peak period a portion of passengers alight the commuter rail to board the Orange Line en route to their final destinations. Although a number of passengers do make the same transfer in reverse in the afternoon, the numbers are not as great.

Inbound ridership along the Haverhill Line increased approximately 16% during the period between 1997 and 2006 (Table 5). The line carries approximately 4,700 inbound passengers each weekday. As seen in Figure 21, the changes in ridership vary from station to station, the growth in the some of the study area stations has been over 100% such as in Lawrence, while ridership in Reading has been relatively stagnant.

Table 5-Average Daily Inbound Boardings on Haverhill Line by Station (I-93 TIS Study Area) (1997 to 2006)

Station	1997	2001	2006
Haverhill	174	355	518
Bradford	389	415	380
Lawrence	250	383	624
Andover	435	619	543
Ballardvale	138	334	273
North Wilmington	113	180	251
Reading	982	878	717
Wakefield	893	679	618

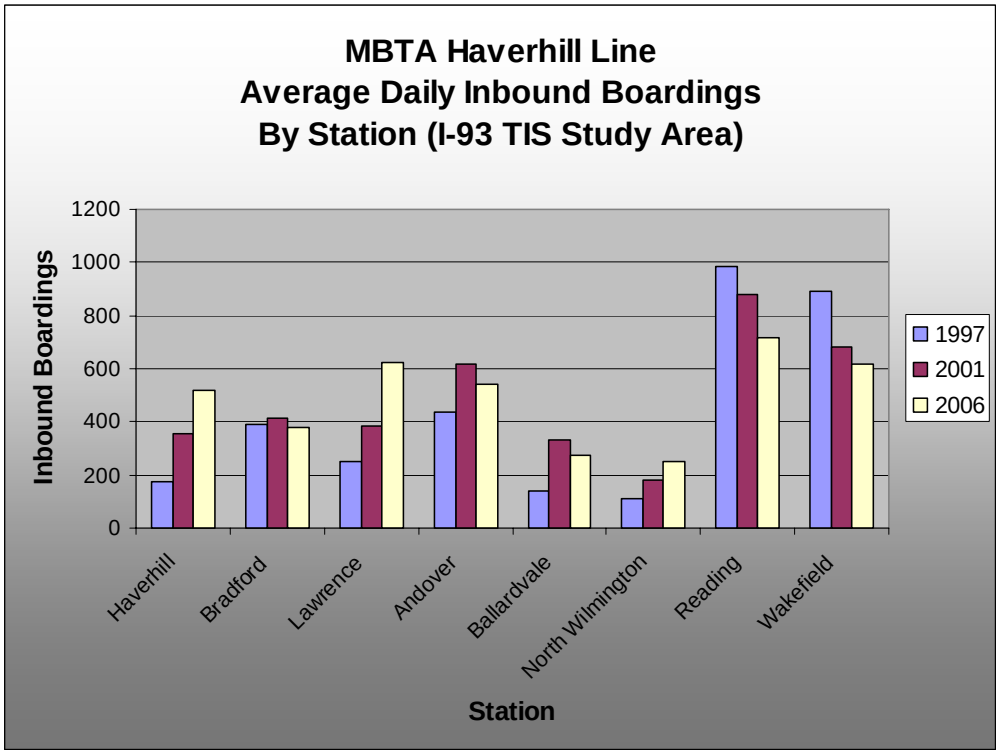


Figure 21-Haverhill Line Daily Inbound Boardings by Station (1997, 2001, 2006)
Source: MBTA Ridership and Service Statistics, 2006.
Note: Ridership statistics represent an average of passenger count data taken on 4/6/06, 7/27/06, 9/14/06, and 12/7/06.

Lowell Line

Service on the Lowell Line operates primarily over the New Hampshire Main Line (NHML) tracks between North Station and downtown Lowell. This route, which is approximately 25 miles in length, includes 9 stations. These stations are: North Station, West Medford, Wedgemere (Winchester), Winchester Center, Mishawum (Woburn), Anderson RTC (Woburn), Wilmington, North Billerica, and Lowell.

The MBTA operates 58 trains (30 inbound and 28 outbound) on the Lowell Line service on a typical weekday. Ten of the 58 trains operate only to/from Anderson RTC, four trains originate/terminate in Haverhill and use the Wildcat Branch to connect to the Lowell Line, north of Wilmington Station. The remaining 44 of the trains originate/terminate in Lowell, three of which run express, skipping Winchester Center, Wedgemere and West Medford Stations.

There are limited connections to other transit services along the line. The only connection to other MBTA rail services are those that can be made at North Station. This includes connections to both the MBTA Orange Line and the MBTA Green Line. A connection to the Amtrak Downeaster service or Massport Logan Express Bus service can be made at Anderson RTC. There are Lowell RTA or MBTA services available at five of the nine stations. The MBTA's Orange Line can be boarded at Malden Center. During the morning peak period a significant portion of passengers alight the commuter rail to board the Orange Line en route to their final destination. Although a number of passengers do make the same transfer in reverse in the afternoon, the numbers are not as great.

Ridership along the Lowell Line increased approximately 35% during the period between 1997 and 2007 (Table 6). The line carries approximately 5,900 inbound passengers each weekday. As seen in Figure 22, the changes in ridership varies from station to station. The growth in some of the study area stations has been substantive, such as at Wilmington Station following the reconstruction of the station and parking. Other stations, such as those in Woburn (Anderson RTC and Mishawum) have also seen substantial growth.

Table 6-Average Daily Inboard Boardings on the Lowell Line by Station (I-93 TIS Study Area) (1997 to 2006)

Station	1997	2001	2006
Lowell	1257	1292	1652
North Billerica	798	904	1017
Wilmington	425	484	589
Anderson/Mishawum	781	1039	1024
Winchester	482	628	619
Wedgemere	314	324	463
West Medford	298	309	535

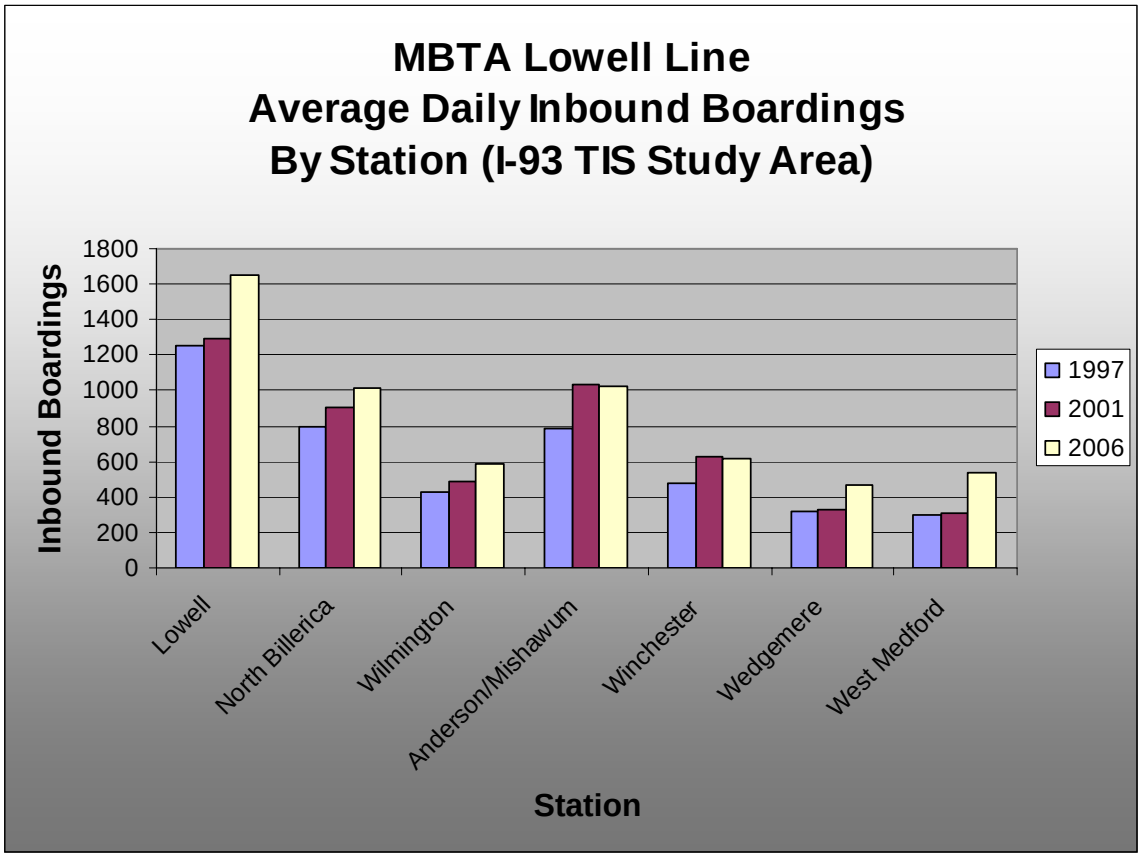


Figure 22-Lowell Line Daily Inbound Boardings by Station (1997, 2001, 2006)
Source: MBTA Ridership and Service Statistics, 2006.
Note: Ridership statistics represent an average of passenger count data taken on 4/6/06, 7/27/06, 9/14/06, and 12/7/06.

b. Amtrak

In New Hampshire, active passenger rail service is limited to the Amtrak Downeaster and Vermonter services. Downeaster service travels to the northeast of the New Hampshire communities in the study area. New Hampshire stations include Dover, Durham and Exeter. The Vermonter travels primarily along the Connecticut River on the western side of the state. The Vermonter has one station stop in New Hampshire located in Claremont.

The Downeaster offers four round-trips every day, operating roughly along the coast from Boston to Portland, Maine. Each train has 234 available seats. It adds extra cars leased from Amtrak during peak demand. Amtrak's Downeaster uses the MBTA's Lowell Line from North Station to Wilmington Station, the Wildcat Branch to Wilmington Junction, and the Haverhill/Reading

Line to Haverhill Station. From the New Hampshire state line to Portland, it uses Pan Am Railways trackage.

One-way fares on the Downeaster to and from New Hampshire stations are as follows:

	Dover	Durham	Exeter
Portland	$11	$13	$15
Old Orchard Beach	9	11	13
Saco	7	9	11
Wells	5	7	9
Dover	-	5	7
Durham	5	-	5
Exeter	7	5	-
Haverhill	9	7	5
Woburn/Anderson	13	11	8
Boston	16	14	11

The Downeaster has been steadily improving its services, as noted in customer surveys and statistics such as on-time performance. Its ridership has been increasing as well. Boardings from New Hampshire stations represent approximately 22 percent of all boardings along the line. Downeaster services are coordinated with the C&J Trailways motor coach service. C&J Trailways accepts FlexPass tickets purchased from the Downeaster for travel on C&J Trailways schedules between Boston, South Station and Dover and Durham, NH. The Downeaster and C&J Trailways depart from the Dover Transportation Center. In Boston, C&J Trailways serves South Station; the Downeaster serves North Station.

Average daily ridership (boardings and alightings), combining weekdays, weekends and holidays in 2006 roughly ranged between 970 in the winter months and 1,150 in the summer months. In 2006, ridership on the Downeaster increased by approximately 16 percent from the previous year. Figure 23 depicts moderate increases between February 2005 and February 2007 for the estimated daily ridership of southbound boardings. Ridership is expected to continue to grow in 2007 when a fifth round trip is added to the Downeaster train schedule.

Although the number of riders is not high, there is growth in ridership between Boston and Haverhill between March 2005 and February 2007. As shown in Figure 24, ridership has steadily increased since November 2006.

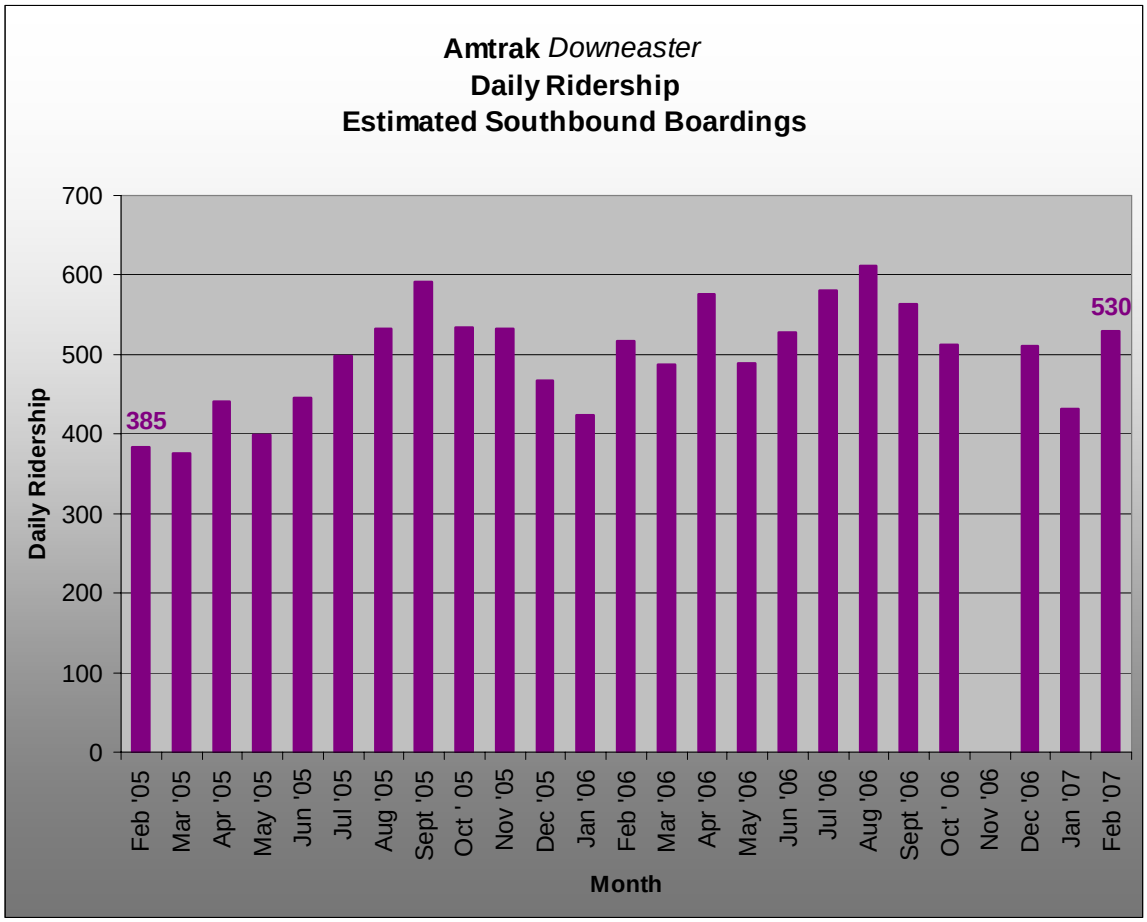


Figure 23-Daily Southbound Boardings on the Amtrak Downeaster (2005 to 2007)
Source: Northern New England Passenger Rail Authority

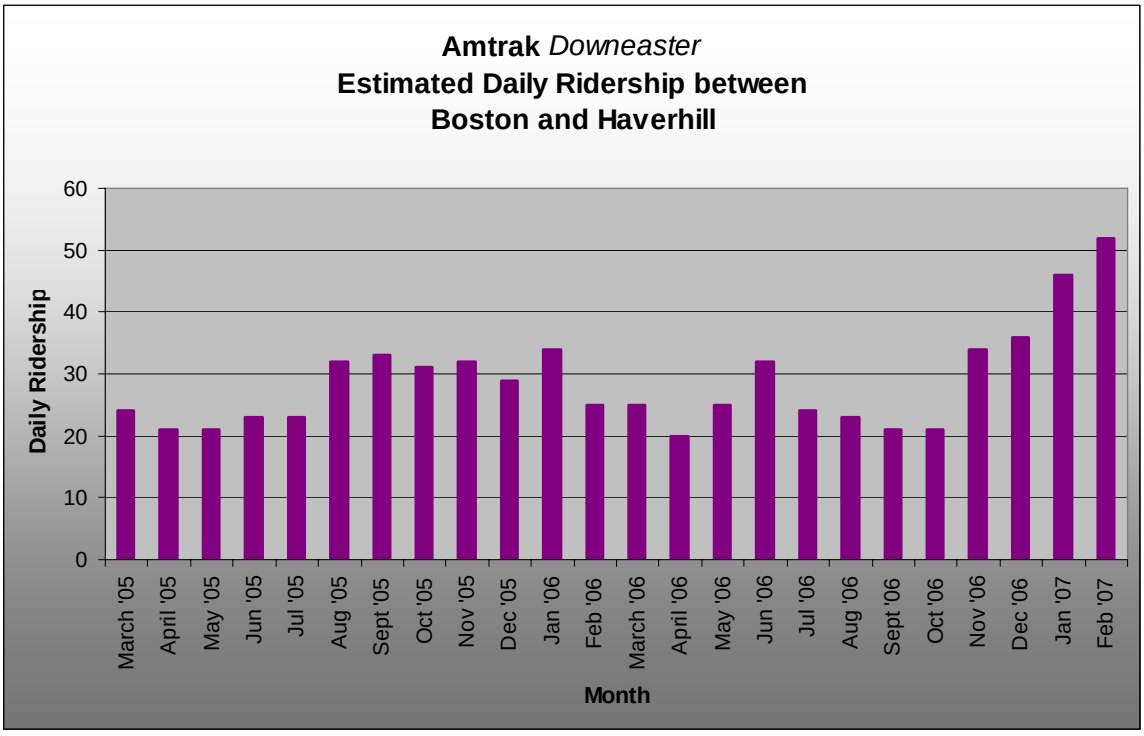


Figure 24-Daily Amtrak Ridership between Boston and Haverhill
Source: Northern New England Passenger Rail Authority

c. Park and Ride Lots

Park and ride facilities offer commuters a place to park their vehicles in order to take advantage of other forms of transportation. As a result, traffic and vehicular emissions are reduced. In the I-93 TIS Study Area, there are approximately 8,100 parking spaces in park and ride lots. An estimated 6,300 and 1,800 spaces are in Massachusetts and New Hampshire, respectively. Tables 7 and 8 depict the breakdown of park and ride lots in each state.

The majority of park and ride parking spaces in the study area in New Hampshire are located in Nashua, Londonderry and Concord, comprising approximately 1,400 spaces. According to the *Nashua Metropolitan Area Long-Range Transportation Plan 2005-2025*, there are two new park and ride lots planned for the Nashua Region: a 250-space parking garage intermodal facility in Merrimack and a 1,000-space intermodal facility in south Nashua. The New Hampshire Regional Planning Commission is currently working with NHDOT to develop strategies for obtaining a higher utilization of park and ride lots throughout the state. Strategies include, but are not limited to, improved rail shuttle and bus access.

Table 7-Park and Ride Facilities in New Hampshire (I-93 Corridor)

Town	Location	Number of Spaces
Nashua	NH 111, FE Everett Turnpike, Exit 5W	108
Nashua	NH 101A, FE Everett Turnpike, Exit 7E	50
Nashua	FE Everett Turnpike, Exit 8	350
Salem	Route 97 at I-93, Exit 2 (park-ride/bus facility to be completed October 2008)	472*
Windham	NH 111 at I-93, Exit 3	150
Londonderry	NH 102 at I-93, Exit 4 (bus facility to be constructed)*	471
Londonderry	Route 28 at I-93, Exit 5 (park-ride facility/bus terminal to be constructed)	443*
Hampstead	Junction of NH 111 & 121	104
Hooksett	NH 3A, I-93, Exit 11	45
Bow	NH 3A at Junction of I-89 and I-93	60
Concord	NH 13, Exit 2	100
Concord	I-93, Exit 14	340
	Total Number of Spaces	1,778
	TOTAL FINAL BUILDOUT	

Source: NHDOT

*: Facilities/spaces to be constructed as part of I-93 Improvements project

In Massachusetts, more than one-third of park and ride parking in the study area is located at Lawrence Station on the Haverhill Line or at Anderson Regional Transportation Center Station on the Lowell Line (Table 8). According to a survey conducted by the Central Transportation Planning Staff in the fall of 2005 and spring of 2006, the majority of parking lots are filled at or close to capacity by 9:00 a.m. The cost of parking is low with daily parking ranging from $2.00 to $3.50. Some lots require permits or do not charge a parking fee.

Table 8-Park and Ride Facilities in Massachusetts

Station Name/ City/Town	Lot Ownership	Parking Spaces	Occupied Parking Spaces [1]	% Parking Space Usage	Time of Last Observation (a.m.)	Time of Last a.m. Peak Period Inbound	Parking Fee
Haverhill Line							
Haverhill	MBTA	153	153	100	7:25	8:43	$2.00
Bradford/ Haverhill	*Total*	*373*					
	MBTA	293	81	28		8:45	$2.00
	On-street	80	40	50		8:45	None
Lawrence	MBTA	895	202	19		8:54	$3.00
Andover	*Total*	*202*				8:59	
	MBTA	152	150	99	8:59		$2.00
	On-street	50	50	100	8:59		None
Ballardvale/ Andover	MBTA	120	120	100	7:15	9:03	$2.00
North Wilmington	Town	49	49	100	7:53	9:09	None
Reading	*Total*	*417*				9:17	
	MBTA	73	73	100	7:55		$2.00
	Town	42	42	100	8:36		$2.00
	Resident	266	266	100	8:02		Permit
	Res. on-street					9:23	Permit
Wakefield	*Total*	*130*					
	Town	113	113	100	7:44		$2.00
	On-street	17	17	100	7:00		None
Lowell Line							
Lowell	LRTA	774	609	79	8:25	8:25	$3.50
North Billerica	*Total*	*534*				8:33	
	LRTA	530	530	100	7:58		$2.00
	On-street	4	4	100	7:58		$2.00
Wilmington	MBTA	191	191	100	7:33	8:41	$2.00
Anderson RTC/ Woburn	MBTA/Mass Highway/ Massport[2]	1,510	373	25	8:45	8:45	$2.00
Winchester	Town	150	136	91	8:53	8:53	$2.00
Wedgemere/ Winchester	*Total*	*151*					
	Town	119	119	100	7:55		None
	On-street	32	32	100	7:55		$0.00
West Medford	Total	77				8:59	
	Res. on-street	41	32	78	8:59		Permit
	Private	36	36	100	7:59		None
Express Bus							
Woburn[3]	MBTA	78	50	100	8:00	9:00	None
Towns							
Andover	MassHighway (1-93 exit 42, Dascomb Road)	71[4]	74	104			None
Methuen	MassHighway (I-93 exit 47,	189	94	50			None

Table 8-Park and Ride Facilities in Massachusetts

Station Name/ City/Town	Lot Ownership	Parking Spaces	Occupied Parking Spaces [1]	% Parking Space Usage	Time of Last Observation (a.m.)	Time of Last a.m. Peak Period Inbound	Parking Fee
	Pelham Street)						
Tyngsboro	MassHighway (Route 3 exit 35, Route 113 or Kendall Road)	250[5]	8	3			None
Total Number of Parking Spaces		**6,314**					

[1] Parking spaces occupied at the time of the last a.m. peak period train.
[2] Facility is operated by Massport. The ARTC has a total of 2,400 spaces. 1,510 spaces are for people who either carpool or use the commuter rail. The remaining 890 spaces are used for Logan Express.
[3] For bus #354. Lot is on Montvale Avenue.
[4] There are conceptual plans to expand this parking facility by adding approximately 85 spaces.
[5] New lot opened in Fall 2006.

Source: CTPS – Fall 2005/Winter 2006.

5. Freight Service

The portion of the Haverhill Line extending from Lowell Junction through Lawrence and Andover, Massachusetts also accommodates heavy freight use.

The Pan Am Railway, a wholly owned subsidiary of the Guilford Rail System, operates freight service along the line as part of its network that provides freight service to Northern New England. The segment between Lowell Junction (in Wilmington, MA) and Haverhill carries approximately five million gross ton-miles of freight each year and is key segment of the second busiest freight line in New England. The principal industrial use of the line is related to the manufacture of paper and forest products produced in Maine. Paper is delivered in boxcars from paper plants in Maine. Clays and chemicals used to process the paper travel to Maine from the south in tank cars. The construction industry also makes extensive use of the line. Stone, sand and gravel from quarries in New Hampshire are regularly shipped on the line to Boston.

Guilford's Lawrence Yard at Andover Street in Lawrence is the busiest freight yard in Essex County and the busiest yard on the Guilford network between Portland, Maine and Ayer, Massachusetts. At this time, all rail freight traffic to warehouses and customers on former B&M lines in the greater Boston area are served from Lawrence yard.

To the north, along the Manchester & Lawrence Branch (East Rail Corridor) there is limited freight service. In 2000, Guilford filed for abandonment of the M&L Branch tracks from Milepost (MP) 4.65 to MP 7.6 in Salem, NH. In 2001, Guilford filed for abandonment of the M&L Branch

from MP 1.4 in Lawrence to MP 4.4 in Salem, NH. Pan Am now operates freight service only along less than 1 mile of the M&L Branch within Lawrence. The M&L Branch in New Hampshire is inactive.

Freight service currently operates north of the Lowell Line on the West Rail Corridor. The former B&M New Hampshire Main Line currently operates as the Pan Am's Freight Main Line and Northern Main Line. The route into New Hampshire accommodates two to three coal trains per week (to the Bow power plant), and general freight for customers located in the Nashua, Manchester and Concord regions.

6. Bus Services

Regional bus services within the I-93 TIS Study Area are primarily provided by private bus carriers, with some subsidies provided by NHDOT. The bus routes in the study area that provide service to Boston are shown in Figure 25, and bus ridership estimates provided by the private bus operators and NHDOT are shown in Table 9.

Bus services provided within the study area are discussed further below.

Table 9-Annual Ridership (One-way Passenger Trips) on Bus Commuter Routes

Concord Stickney Avenue	131,000
Manchester	118,000
Londonderry Exit 4	126,000
Dover downtown	50,000
Portsmouth Exit 3	350,000
New London	11,000
Hanover/Lebanon	85,000
Nashua Exit 8 (2007)	20,000 (projected)
Nashua Exit 6 (2007)	105,000 (projected)
Londonderry Exit 5 (2008)	257,000 (estimate)
Salem Exit 2 (2008)	110,000 (estimate)
Dover Exit 9 (2008)	100,000 (estimate)
TOTAL	1,463,000

Source: NHDOT

a. I-93 Corridor Bus Services

As part of the I-93 Improvements project in New Hampshire, the NHDOT has identified a need to expand bus service on this corridor to meet the growing demand, address traffic congestion, and help reduce auto emissions in southern New Hampshire and Massachusetts.

According to NHDOT, to provide this expanded service, new park–and-ride lots with bus terminals will be constructed at Exit 2 in Salem and Exit 5 in Londonderry. NHDOT will also construct a bus maintenance and storage facility near Exit 5. The NHDOT will improve the existing commuter bus service at Exit 4 in Londonderry through construction of a bus terminal and purchase of two commuter coaches. The NHDOT will purchase 14 commuter coaches and contract with a private bus operating company to conduct the expanded bus service. The expanded service will be supported with Congestion Management Air Quality (CMAQ) funds for the first three years of operation. The NHDOT will also provide funds for marketing to build public awareness of the commuter bus service, and incentives to encourage people to use transit.

It is projected that the commuter bus services based at Exit 5 and Exit 2 will each offer 23 round trips per weekday, with half-hourly service during peak hours and hourly off-peak service. Limited service will be offered on weekends as well. Off-peak trips may be combined between the two sites depending on ridership, which could slightly reduce the total number of trips offered. Estimated total ridership for the new service is approximately 462,000 passenger trips per year.

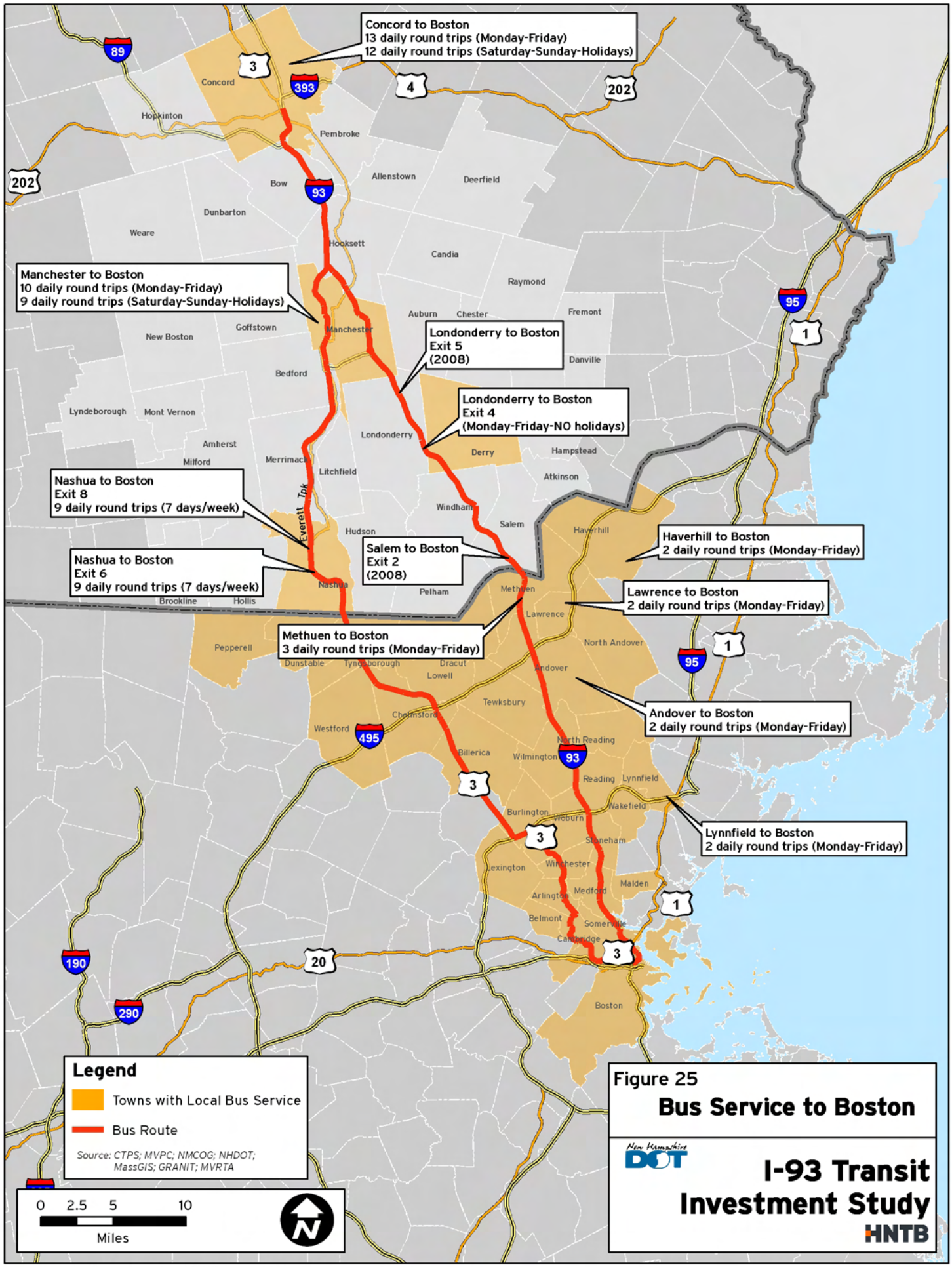
An essential feature of the of I-93 project includes the purchase of 16 commuter bus coaches to enhance existing commuter bus service to be operated along the corridor by private operators out of the park and ride lots at Exits 5, 4 and 2.

b. Other Bus Services

Manchester

The **Manchester Transit Authority** provides local bus service on thirteen (13) routes throughout the city. Some services extend just into the neighboring communities of Bedford, Goffstown, Londonderry, and Hooksett. Intercity bus service is provided from the Manchester Transit Center on Canal Street by Vermont Transit, Concord Trailways and Peter Pan Bus Lines.

Vermont Transit provides service between Hanover, NH and Boston, serving both the Manchester-Boston Regional Airport and the Manchester Transit Center. The buses travel via U.S. Route 3 and the Everett Turnpike to access Nashua and Lowell before continuing on to Boston. The two southbound trips arrive in Boston at 4:40 p.m. and 10:55 p.m. An additional three trips operate between the Manchester-Boston Regional Airport and Boston. The northbound service departs Boston at 8:00 a.m., 1:15 p.m., and 11:45 p.m. One way fares are $14.75 and the roundtrip fare is $26.50.



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Concord Trailways offers frequent weekday service between Manchester and Boston. Thirteen (13) southbound and sixteen (16) northbound trips serve Manchester. On weekends, there are twelve (12) southbound and thirteen (13) northbound trips to Manchester. Fares are offered as 10-ride passes for $65.00. One-way fares from Manchester are $11.00 to South Station and $15.00 to Logan Airport. Roundtrip fares are $20.00 and $27.00 respectively.

Peter Pan offers daily service between Concord and Worcester with a stop in Manchester. One daily roundtrip is offered.

Londonderry

Concord Trailways offers eight (8) southbound and nine (9) northbound trips between Londonderry and Boston (Boston Commuter service). Londonderry has no weekend service. The trip between Londonderry and South Station takes approximately an hour and ten minutes in the southbound direction and an hour in the northbound direction. Limited midday service is offered. Commuter stops are offered on the southbound buses before their arrival at South Station at State and Park Streets. Fares are offered as 10-ride passes for $65.00 or $10.00 one way or $18.00 roundtrip to South Station. Logan Airport service is offered at $14.00 one way and $25.00 roundtrip.

Plaistow

While the Salem, Plaistow and Windham MPO does not have a single agency that provides transportation, there are several alternatives for commuters to Boston including intercity bus service provided by The **Coach Company** and **Concord Trailways** (Londonderry). The Coach Company offers three inbound trips in the morning and four outbound trips in the evening between Plaistow and several locations in downtown Boston including Haymarket and Copley Square. One way fares are $10.50 and 10 and 20 ride passes are available. Airport service is also offered for a fare of $17.00. The trip takes approximately one and a half hours. As discussed above, Concord Trailways provides service between Londonderry and Boston. In addition, commuters can use the Boston Commuter Bus service offered out of the Pelham Street Park and Ride in Methuen.

Nashua

Nashua Transit System (NTS) provides public bus fixed route service and demand-response paratransit service for residents of Nashua through six routes that cover the most populated neighborhoods and most commercial and industrial areas. NTS also provides demand response service to those with special mobility needs, the disabled, and the elderly. Fixed route service in Nashua is called Citybus. Nashua Transit became one of the first transit systems in New Hampshire to offer evening service, two fixed routes with minor deviations operate until 11 p.m.

Intercity bus service is provided by Concord Trailways on the Boston Express[4]. Nine (9) roundtrips are provided daily between the Nashua Park-and-Ride facility at Exit 8 and South Station and Logan Airport. The one-way introductory fare to South Station and Logan Airport are $5.00 and $7.00 respectively, and are temporary introductory fares.

Methuen, Lawrence, Andover

The **Merrimack Valley Regional Transit Authority (MVRTA)** provides local fixed route and paratransit service throughout the region from a transportation hub in Lawrence. Bordered on the north by the state of New Hampshire and on the east by the Atlantic Ocean, the MVRTA's service area includes Andover, Amesbury, Haverhill, Lawrence, Merrimac, Methuen, Newburyport and North Andover. The Authority also provides service to the Lowell Transit Center for connections with the Lowell Regional Transit Authority (LRTA).

The MVRTA provides an express bus service between Methuen, Lawrence, Andover and Boston. Three roundtrips serve the Pelham Street Park and Ride at Exit 47 off I-93 in Methuen, the McGovern Transportation Center in Lawrence, several stops along Route 28 in Lawrence and Andover before joining I-93 to travel to Boston. In Boston, the bus provides connections to the rapid transit lines at Haymarket, Government Center, Park Street as well as serving the Transportation Building and Copley Square. Trip times are estimated at a little over an hour and a half, with Boston arrivals at 7:20 a.m., 7:50 a.m. and 8:20 a.m. One way fares are $5.00. Ten-ride commuter fares of $40.00 offer frequent riders savings over the one-way fare.

Lowell

The **Lowell Regional Transit Authority** provides fixed route and paratransit bus service to 7,000 commuters daily. Twenty routes are operated by the LRTA, including service to Burlington, Chelmsford, Dracut, Tewksbury, and Tyngsboro six days a week. Additionally, travelers can transfer to the MVRTA system at the Lowell Transit Center located at the Gallagher Terminal, also home to the MBTA Lowell Commuter Rail Service. The LRTA provides a free shuttle bus service between downtown Lowell and the Gallagher Terminal (Lowell Commuter Rail) every half hour on weekdays from 6:00 a.m. to 6:00 p.m.

Intercity bus service is offered only by **Vermont Transit**. Vermont Transit provides one roundtrip a day between Lowell and Boston. The buses travel via U.S. Route 3 and the Everett Turnpike to access Lowell before continuing on to Boston. Travel times are forty to forty five minutes and the service is not oriented to commuters, with an arrival time of 4:40 p.m. in Boston and a departure at 1:15 p.m. from Boston. Monday through Thursday the one way fare is $12.50

[4] Boston Express service commenced February 13, 2007.

and the roundtrip fare is $25.00. The weekend fare is set higher at $15.25 for a one way trip and $29.50 for a roundtrip.

7. Transportation Management Organizations/ Associations

Transportation Management Organizations/Associations (TMOs/TMAs) are private, non-profit organizations that provide transportation services for a particular area primarily through area employers. These organizations can provide a variety of services that provide commute alternatives, encourage efficient use of transportation and parking, and support transportation demand management strategies. The two TMO/TMAs in the project area are located within the Merrimack Valley Region of Massachusetts.

Both states also sponsor ride-matching and ridesharing programs through MassRIDES and New Hampshire Rideshare.

a. Merrimack Valley TMA

The Merrimack Valley TMA (formerly known as the River Road TMA) was originally established in 1997 to provide transportation programs for member employees in the River Road area of Andover. As the area served expanded to include Lawrence, Methuen, and North Andover, the organization was renamed in 2004 to reflect the larger geographic base of the areas served along I-93 and I-495.

Commuter services offered by the TMA include a ridesharing program, guaranteed ride home program, worksite incentive program, bike/walk incentives, and transit subsidy. The Merrimack Valley TMA has an employee vanpool program subsidized by a private employer that operates from locations in South Berwick, ME and from Dover, Portsmouth, Rochester, and Barrington, NH.

The TMA reported that vanpools providing service to the River Road/Dascomb Road area of Andover had either begun to form or were close to commencing service from two other areas:

- I-93 from Concord, Manchester, and Londonderry; and the
- New Hampshire, Maine, Massachusetts Seacoast.

The TMA also was exploring opportunities to provide vanpools to River Road/Dascomb Road from the following locations:

- Route 2/Route I-495 in Worcester, Leominster, and Littleton;
- Route 101/Route 3/Route I-495 from Greenville and Nashua NH and Lowell, MA;
- Epping NH and Haverhill, MA.

b. Junction TMO

The Junction TMO was incorporated in 2000 as a non-profit, consensus-based organization of employers, public sector representatives, and business associations working to address transportation issues in the Lowell Junction/Ballardvale Street area of Andover and Wilmington. Services provided include shuttle services, ridesharing program, guaranteed ride home program, preferred parking, bike/walk, and other non-single occupant vehicle commuter incentives. The shuttle service includes a door-to-door subscription shuttle service, as well as a shuttle service to the Ballardvale Commuter Rail Stop on the Haverhill Line.

According to *The Junction/Route 93 Development Area: Our Opportunity for Smart Growth and Regional Economic Development in the Merrimack Valley and Northeast Massachusetts*, discussions are underway with regional transit agencies to connect the Junction with area transit nodes, including:

- Gallagher Terminal in Lowell, with connections to the Lowell Regional Transit Authority bus network,
- McGovern Transit Center in Lawrence, linking to the Merrimack Valley Regional Transit Authority bus network, and
- Anderson Regional Transportation Center in Woburn, connecting to the MBTA transit system.

IV. Consistency with Long Range Plans

A. Transit-Oriented Development: Consistency with Smart Growth Principles

In addition to meeting transportation needs within the corridor, a potential benefit associated with the project would be the promotion of sustainable development and support of economic expansion. Development of intermodal transportation service options is considered essential to promote Transit-Oriented Development, which is defined as relatively dense residential and commercial development within one-half mile (walkable distance) of transit stations. This type of development is seen as more consistent with traditional compact development and historic settlement patterns, in contrast to suburban "sprawl" that is reliant on motor vehicle dependent mobility and highways. Sprawl or dispersed development is generally viewed as promoting increasing highway congestion by increasing dependence on automobiles. The national movement towards this type of land use planning is gaining support in New England.

The New Hampshire Office of Energy and Planning, in its publication "*Achieving Smart Growth in New Hampshire*," offered eight principles for Proactive Growth Management, including the following:

- "Maintain traditional compact settlement patterns to efficiently use land, resources, and investments in infrastructure.
- "Foster the traditional character of New Hampshire downtowns, villages, and neighborhoods by encouraging a human scale of development that is comfortable for pedestrians and conducive to community life.
- "Incorporate a mix of uses to provide a variety of housing, employment, shopping, services, and social opportunities for all members of the community.
- "Provide choices and safety in transportation to create livable, walkable communities that increase accessibility for people of all ages, whether on foot, bicycle, or in motor vehicles."

The *New Hampshire Long Range Transportation Plan, Final Report of the Community Advisory Committee to the Commissioner* (June 9, 2006) states that: "A more comprehensive, statewide initiative is needed encompassing all sources and uses of public and private transportation funding." The plan recognizes institutional impediments to implementing future transit or rail improvements, namely, that the New Hampshire Constitution (Part II, Article 6-a) prohibits of use of funds accrued from gasoline tax for funding railroad or transit improvements.

The *Commonwealth of Massachusetts Long-Range Transportation Plan* (2006) also cites, as a guiding principle, mobility of people and goods: "In order to improve the quality of life and provide economic opportunities, the transportation system of Massachusetts shall satisfy the

needs of people and freight. The Commonwealth shall satisfy these mobility needs through a comprehensive set of strategies that focuses on system management and demand management, as well as targeted investments in system improvement."

The Massachusetts Long-Range Transportation Plan cites the importance of incorporating multi-modal solutions and encouraging transit-oriented development: "Broadening transportation choices can help mitigate congestion by reducing the amount of travel on a congested mode, shifting travel to off-peak periods, eliminating the need for certain trips, and creating a more balanced transportation network…Of particular importance for sustainability and economic development is the…emphasis on transit-oriented development."

The Massachusetts Office of Commonwealth Development has developed ten principles for sustainable development to guide the Commonwealth's approach to Smart Growth. These include the following:

- **"Concentrate development—**Support development that is compact, conserves land, integrates uses, and fosters a sense of place. Create walkable districts mixing commercial, civic, cultural, educational and recreational activities with open space and housing for diverse communities.
- **"Provide transportation choice—**Increase access to transportation options, in all communities, including land- and water-based public transit, bicycling, and walking. Invest strategically in transportation infrastructure to encourage smart growth. Locate new development where a variety of transportation modes can be made available.
- **"Expand housing opportunities—…**Coordinate the provision of housing with the location of jobs, transit, and services. Foster the development of housing, particularly multi-family, that is compatible with a community's character and vision.
- **"Increase job opportunities—**Attract businesses with good jobs to locations near housing, infrastructure, water, and transportation options…Support the growth of new and local businesses.
- **"Foster sustainable businesses—…**Strengthen sustainable businesses. Support economic development in industry clusters consistent with regional and local character…"

One of the goals of the cooperation between NHDOT and MEOT in conducting the I-93 Transit Investment Study is to achieve consistency with the Commonwealth's Sustainable Development Principles.

B. Transportation Needs in MA and NH Long Range Transportation Plans

The following project needs have been identified in the New Hampshire and Massachusetts plans:

- The *New Hampshire Long Range Transportation Plan, Final Report* (June 9, 2006) states that: "The southern (especially southeastern) region needs to manage new travel demand and expand transportation choices, in an increasingly urbanized environment. This is especially true in Hillsborough and Rockingham Counties which now represent more than 50% of the total state population. The southern areas of the state face a particular challenge: interstate commuting. In 2000, over 82,000 New Hampshire commuters traveled to jobs in Massachusetts daily, while 23,500 Massachusetts commuters traveled to New Hampshire. In these areas, commuters are traveling further which, along with rapid population growth, increases congestion problems."
- The *New Hampshire Long Range Transportation Plan* also points out: "People who don't travel may have even more severe transportation needs than those who do—if the reason they don't travel is because they have no options. A strong majority of public feedback favored the creation of more public transportation options, particularly in the more rural areas and particularly for access on the regional and inter-regional levels. Some sort of basic, statewide public transportation service is needed…A growing percentage of New Hampshire residents do not drive. The percentage of residents who don't have a license, or can't drive due to disability or poor health is about 25% and growing."
- The *New Hampshire Resident Views on the Use, Availability, and Need for Public Transportation* (December 2005) presented survey results that indicated an estimated 34,000 residents had lost or turned down a job because they did not have a reliable ride. Approximately 62,000 had missed a medical appointment because they could not get a ride, with 11,000 having missed four or more appointments in the last 12 months alone.
- The results from the *Granite State Poll, Support for New Hampshire Passenger Rail Service Survey* (February 2007) prepared for the Nashua Regional Planning Commission by the University of New Hampshire showed that 87% of those New Hampshire residents polled favor expanding passenger rail service in New Hampshire. The study also reported strong support (73%) for creating a Rail Authority to oversee potential rail expansion.
- The *Commonwealth of Massachusetts Long-Range Transportation Plan* (2006) states: "A close relationship exists between population and job growth. In recent years, metropolitan Boston has drawn an increasing number of non-resident workers from New Hampshire and Rhode Island, which pushed employment growth faster than population."
- The plan elaborates on this trend: "Some of the highest rates of growth during the last decade occurred in the regions between metropolitan Boston and New Hampshire. The accessibility of these regions via Interstates 93 and 95 and Route 3 to both metropolitan Boston and

Nashua, and ample land for development near these highways attracted many new employers and enabled workers to commute long distances from multiple directions. Employment in this area grew by 18 percent…."

- The Massachusetts Long Range Plan states that: "Population and employment growth is projected in most regions, but with much of the growth expected to center in the eastern portion of the Commonwealth, including the Merrimack Valley…There will be a continued need for judicious roadway investments and focused investments in commuter rail, bus, rapid transit, and other systems that can reduce congestion and support dense land-use patterns. There is an opportunity to select transportation investments that will make it easier for growth to occur in urban and developed areas that could potentially support transportation alternatives to the automobile. Providing customers with more choices to driving alone will improve the flexibility and efficiency of transportation service delivery."

C. Technical Advisory Committee/Stakeholder Committee

The study is being conducted in consultation with a Technical Advisory Committee (TAC) that provided oversight, direction, and review. The TAC is composed of representatives of both states' transportation agencies, the Federal Transit Administration, Federal Highway Administration, the U.S. Environmental Protection Agency, and the regional planning commissions. The regional planning commissions represented on the TAC include the Metropolitan Area Planning Council, the Northern Middlesex Council of Governments, the Merrimack Valley Planning Commission in Massachusetts and the Nashua Regional Planning Commission, the Rockingham Planning Commission, and the Southern New Hampshire Planning Commission in New Hampshire.

Input into the project development is also being provided by the Stakeholder Committee, with ongoing coordination with representatives from potentially affected communities, including Manchester, Concord, Windham, Derry, Salem, Londonderry, Hudson, and Merrimack in New Hampshire and Woburn, Wilmington, Andover, and Methuen in Massachusetts. Other parties represented on the Stakeholder Committee include the New Hampshire Department of Environmental Services and Massachusetts Department of Environmental Protection. The representatives from the transportation industry and business interests on the Stakeholder Committee include:

- the Manchester-Boston Regional Airport,
- Merrimack Valley Regional Transit Authority,
- Merrimack Valley Area Transportation Company,
- the New England Bus Association,
- the New England Railroad Revitalization Association,
- Pan Am Railway,
- New England Southern Railroad,
- Concord Trailways,

- C&J Trailways,
- First Transit,
- ACI (Paul Revere Transportation),
- Massachusetts Office of Business Development,
- Merrimack Valley Economic Development Council,
- Merrimack Valley Chamber of Commerce,
- Greater Manchester Chamber of Commerce,
- Rockingham County Economic Development Corporation,
- Merrimack Valley TMA,
- Junction TMO, and
- 128 Business Council.

Consultation with the TAC and Stakeholder Committee is being performed through a series of meetings to address consistency with long-range plans of the regional planning commissions and local communities.