



DESCRIPTION OF THE CORRIDOR

The Northeast Corridor extends from Boston Harbor to the New Hampshire border. The corridor is anchored in the south by the Boston neighborhood of East Boston, the densely populated cities of Chelsea and Revere, and the town of Winthrop. The historic factory city of Lynn and the maritime communities of Salem, Marblehead, Beverly, and Gloucester are also in the corridor. Large swaths of the corridor north of Cape Ann are protected marine estuaries. Twenty-three of the municipalities in the corridor are located within the Boston Region MPO area; in addition to the cities and towns already mentioned, they are (proceeding northeast) Saugus, Nahant, Lynnfield, Peabody, Swampscott, Middleton, Danvers, Manchester, Topsfield, Wenham, Rockport, Hamilton, Essex, and Ipswich.

This needs assessment addresses only the needs of the municipalities in the Boston Region MPO portion of the corridor. In doing so, however, it must take into consideration conditions and travel activity in other portions of the corridor. This is reflected in the discussion. The portions of the corridor outside of the Boston Region MPO area are not shown in most of the maps.

Ten corridor municipalities, all located in the northern part of this corridor are outside of the Boston Region MPO area: Boxford, Rowley, Georgetown, Newbury, Groveland, West Newbury, Newburyport, Merrimac, Amesbury, and Salisbury. They are in the Merrimack Valley MPO area.

EXISTING TRANSPORTATION FACILITIES

The major transportation facilities and services in the Northeast Corridor, broken down by mode, are described here. Although this assessment considers the needs in the Boston Region MPO area only, existing transportation facilities outside of that area but within the Northeast Corridor are included in this section for informational purposes.



Highway

The major roadways in this corridor are (see Figure 2-1):

- North–south travel: Interstate 95, Route 1, Route 1A, Route 22, Route 35, Route 97, and Route 107
- East–west travel: Interstate 95/Route 128, Route 16, Route 60, Route 62, Route 114, Route 127, Route 128, Route 129, Route 133, and Route 145

There are 1,821 centerline miles in the corridor:

- State-owned – 163 centerline miles (9%)
- Locally owned – 1,464 centerline miles (80%)
- Privately owned – 194 centerline miles (11%)

When looking at lane miles (as opposed to centerline miles) in the corridor, there are a total of 2,707 lane miles. Of the total lane miles, 36% or 986 lane miles are federal aid eligible.

There are 293 bridges in the corridor:

- State-owned – 249 (85%)
- Locally owned – 40 (14%)
- Other – 4 (1%)

Of the 293 bridges, 128 (44%) accommodate pedestrians as well as motorists, 20 (7%) are for bicyclists and pedestrians only, 42 (14%) are railroad bridges over highways or water, and 4 (1%) are closed.

Park-and-ride facilities that are not connected with a public transit station are located in Peabody (inside of the Boston Region MPO area) and Newburyport and Georgetown (outside of the Boston Region MPO area). They are operated by MassDOT.

Transit

Transit in the corridor includes a variety of modes: commuter rail, intercity rail, rail rapid transit, bus, ferry, and paratransit (provided by the MBTA THE RIDE program and the Cape Ann Transportation Authority); see Figure 2-2. A description of the transit services is provided below.

Commuter Rail and Intercity Rail

Two MBTA commuter rail lines run through the corridor and provide service into North Station in Boston. The stations on the lines, along with their numbers of park-and-ride spaces and average utilization rates, and other selected information as applicable, are:

- Newburyport Line, with five stations:
 - North Beverly – 87 park-and-ride spaces (23% utilization rate); bicycle parking also; bus connections

FIGURE 2-1

EXISTING HIGHWAY TRANSPORTATION FACILITIES – NORTHEAST CORRIDOR

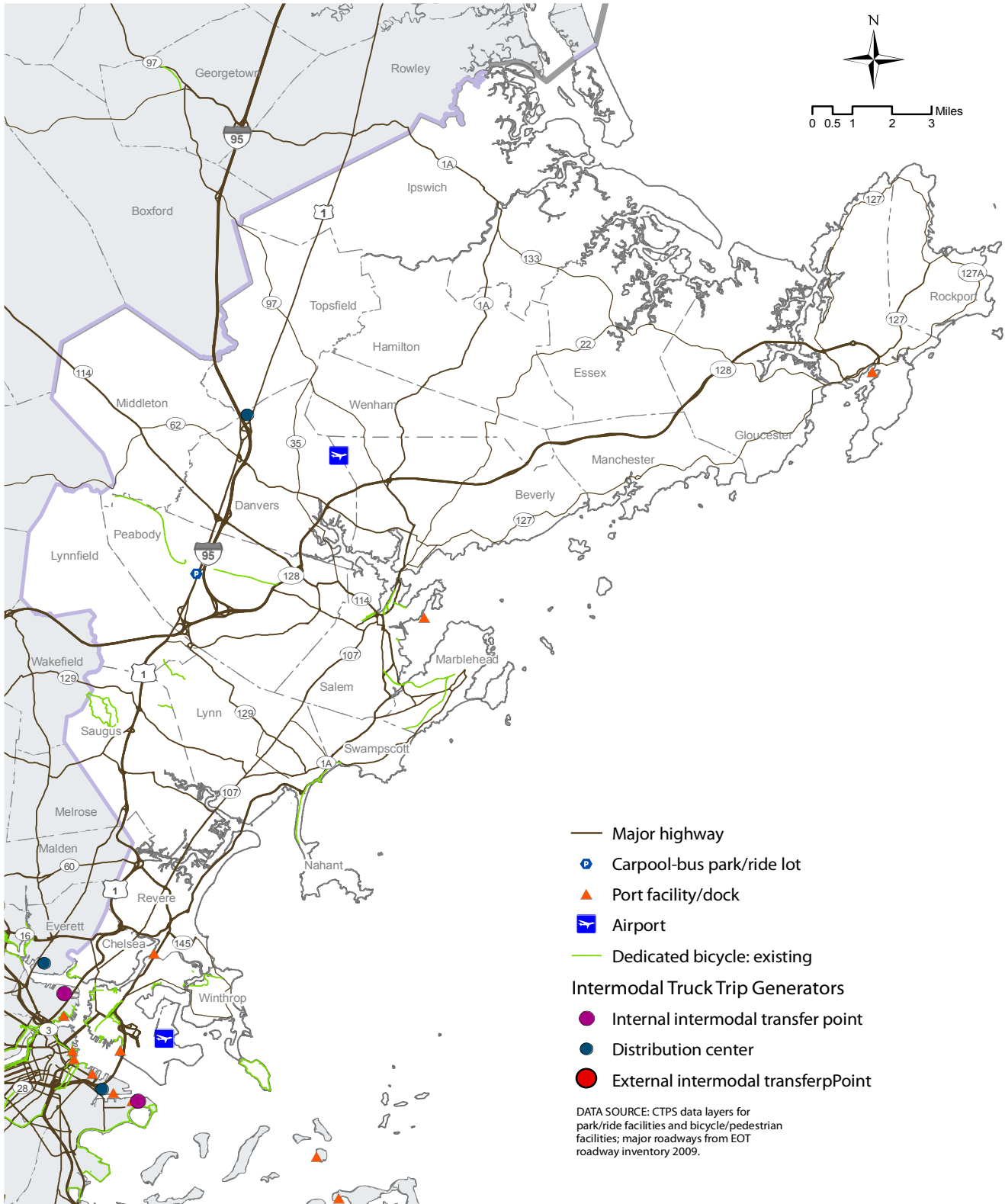
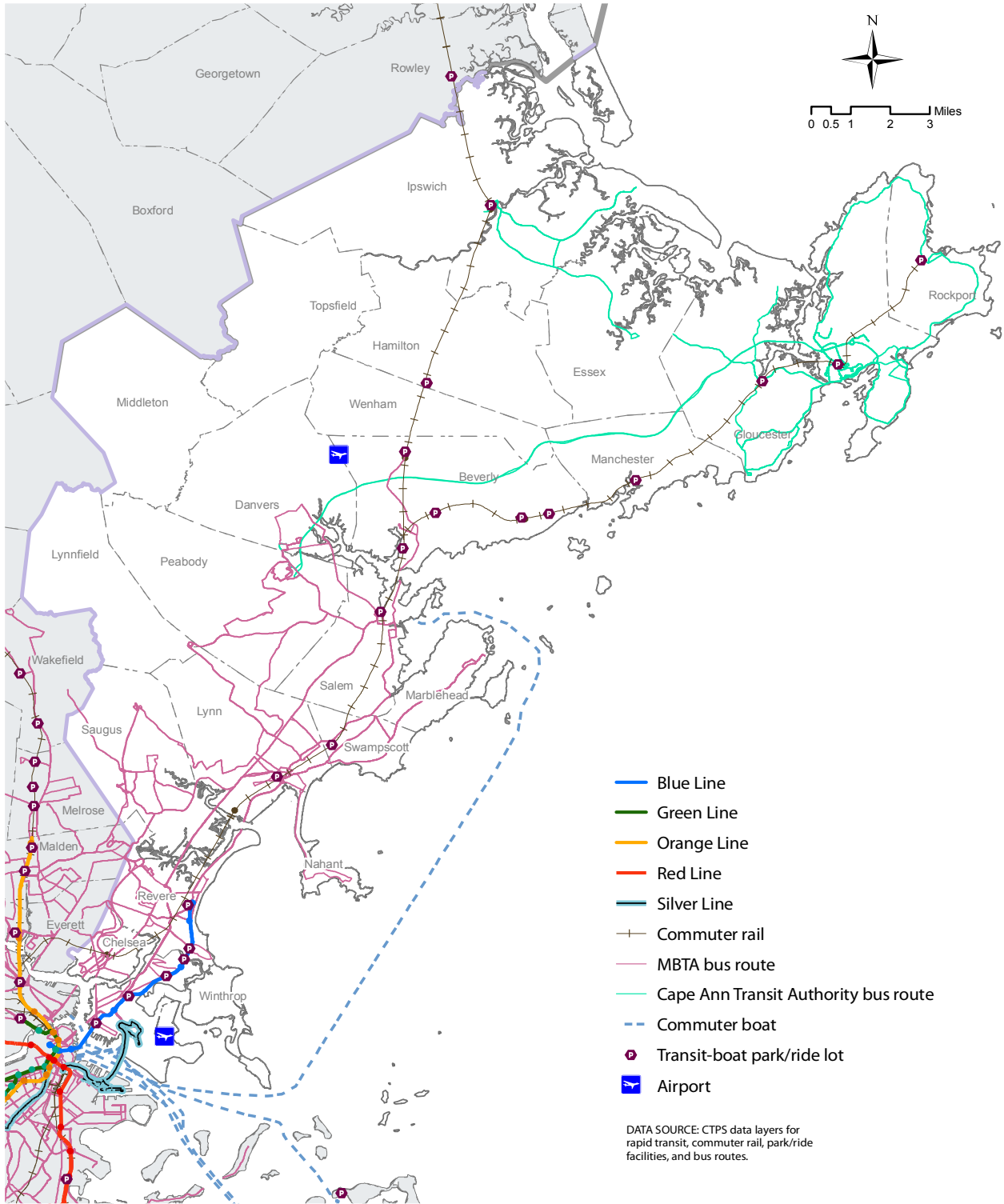


FIGURE 2-2

EXISTING TRANSIT TRANSPORTATION FACILITIES – NORTHEAST CORRIDOR




- Hamilton/Wenham – 194 park-and-ride spaces (29% utilization rate); bicycle parking also
- Ipswich – 170 park-and-ride spaces managed by Town (98% utilization rate); bicycle parking also; bus connections
- Rowley – 282 park-and-ride spaces (16% utilization rate); bicycle parking also; bus connections
- Newburyport – 814 park-and-ride spaces (16% utilization rate); bicycle parking also; local and intercity bus connections
- Rockport Line, with seven stations:
 - Montserrat (Beverly) – 117 park-and-ride spaces (31% utilization rate); bicycle parking also
 - Prides Crossing – No parking
 - Beverly Farms – 25 park-and-ride spaces managed by Massachusetts Bay Commuter Rail (MBCR) (83% utilization rate); bicycle parking also
 - Manchester – 71 park-and-ride spaces managed by Town (96% utilization rate); bicycle parking also
 - West Gloucester – 44 park-and-ride spaces (17% utilization rate); bicycle parking also
 - Gloucester – 100 park-and-ride spaces (18% utilization rate); bicycle parking also; bus connections
 - Rockport – 88 park-and-ride spaces managed by Town (60% utilization rate); bicycle parking also; bus connections
- Stations on the Newburyport/Rockport trunk line:
 - Chelsea – No parking; bus connections
 - Lynn – 965 park-and-ride spaces (17% utilization rate); bicycle parking also; bus hub
 - Swampscott – 131 park-and-ride spaces (69% utilization rate); bicycle parking also; bus connections
 - Salem – 340 park-and-ride spaces (69% utilization rate); bicycle parking also; bus connections
 - Beverly Depot – 200 park-and-ride spaces (81% utilization rate)

MBTA Rail Rapid Transit

The MBTA's Blue Line provides direct access to the MBTA rapid transit system and indirect access to the rest of the transit network for many municipalities in the corridor. Service can be directly accessed at eight stations. These stations, along





with their numbers of park-and-ride spaces and average utilization rates, and other selected information as applicable, are:

- Maverick (East Boston) – No park-and-ride spaces; bicycle parking; major bus hub
- Airport (East Boston) – No park-and-ride spaces; complimentary shuttle service to/from Logan Airport ferry terminal and airline terminals
- Wood Island (East Boston) – No park-and-ride spaces; bus connections
- Orient Heights (East Boston) – 434 park-and-ride spaces (55% utilization rate); bicycle parking also
- Suffolk Downs (East Boston) – 110 park-and-ride spaces (72% utilization rate); bicycle parking also
- Beachmont (Revere) – 430 park-and-ride spaces (50% utilization rate); bicycle parking also; bus connections
- Revere Beach (Revere) – No park-and-ride spaces; bicycle parking; bus connections
- Wonderland (Revere) – 1,257 park-and-ride spaces (97% utilization rate); bicycle parking also; major bus hub

Bus

Numerous public bus services operate in or through the corridor:

- MBTA express buses (11 routes) – These routes offer service from several corridor communities to Wonderland Station on the Blue Line or to Boston Proper, with local segments serving Saugus, Lynn, Swampscott, Marblehead, Salem, and Peabody.
- MBTA local buses (20 routes) – These routes serve many corridor communities, including Chelsea, Saugus, Lynn, Nahant, Swampscott, Salem, Peabody, Beverly, and Danvers. The MBTA also contracts with a private carrier to provide service in Winthrop.
- MBTA bus rapid transit – Silver Line - the SL1 provides service to all terminals at Logan Airport from South Station.
- Cape Ann Regional Transit Authority (CATA) buses (8 routes) – Seven routes connect downtown Gloucester with other points in Gloucester and Rockport. An eighth route operates Saturdays only between Gloucester and the Liberty Tree and North Shore malls.
- Merrimack Valley Regional Transit Authority (MVRTA) buses – The MVRTA provides bus service mostly in communities outside of the Boston Region MPO area in the North Corridor. One year-round route connects Northeast Corridor communities outside the Boston Region MPO area to Boston. The MVRTA also has a summer-only route that serves corridor communities outside the MPO area.

- Municipal and private bus carriers – The City of Beverly oversees a municipal transit service operated by a contractor. Several private bus carriers stop in corridor communities outside the MPO area and then travel through the MPO area of the corridor without stopping. One carrier, Coach Company, provides service from Newburyport via Peabody to downtown Boston.
- Logan Express – Massport operates a route between Peabody and Logan Airport that provides service on weekdays departing Peabody hourly from 4:15 AM to 7:15 PM, with a final trip at 8:45 PM, and departing Logan hourly from 6:15 AM to 8:15 PM, with two additional trips at 10:15 and 11:15 PM. On weekends, 13 trips are operated inbound from 4:15 AM to 9:45 PM, and 12 trips are operated outbound from 6:00 AM to 10:30 PM.



Ferry

The Salem Ferry, operated by Water Transportation Alternatives, runs between Salem and Boston and serves communities on a seasonal basis (the end of May through the end of October).

Connections to MBTA Service from Other Regional Transit Authorities' Services

The two regional transit authorities (RTAs) that serve the corridor along with the MBTA provide connections to MBTA services. Several CATA routes directly serve the Gloucester commuter rail station with varying degrees of synchronization with MBTA train schedules. One route stops at the Rockport commuter rail station. All trips on the CATA Saturday-only Malls Route stop at Gloucester Station. The MVRTA operates two AM peak bus trips and one PM trip directly to the Newburyport commuter rail station on a route that runs from downtown Haverhill through Merrimac and Amesbury to downtown Newburyport.

Transportation Management Associations

The following Transportation Management Associations (TMAs) provide service in the corridor:

- The Logan Transportation Management Organization – provides commuter services to airport employees. These services include carpools, vanpools, and shuttle bus services.

- The North Shore TMA serves Beverly, Danvers, Lynn, Peabody, and Salem. It offers ridematching services, vanpool services, and guaranteed rides home to its members.

Freight

Truck Freight

Trucks are the dominant freight mode in the Boston Region MPO area. They operate on all roadways in the region to transport goods and make deliveries. In this analysis, trucks include three categories of vehicle: tankers, large trucks, and business pickup trucks and vans. The following is a list of the highways in the Northeast Corridor with the highest current volumes of truck traffic:

- Interstate 95 from the Wakefield town line to the Interstate 95/Route 128 split in Peabody, with volumes ranging from 5,000 to 9,000 trucks per day
- Route 128 from the Interstate 95/Route 128 split in Peabody to Route 1A in Beverly, with volumes ranging from 5,000 to 9,000 trucks per day
- Portions of Route 1 from the Tobin Bridge in Boston to Interstate 95 through the municipalities of Chelsea, Revere, Saugus, and Lynnfield, with volumes ranging from 5,000 to 9,000 trucks per day
- Interstate 90 in East Boston, with volumes ranging from 5,000 to 9,000 trucks per day



Rail Freight

Pan Am Railways and CSX operate in the corridor. CSX has operating rights over the state-owned Grand Junction Branch into the Chelsea industrial area. The line serves the New England Produce (NEP) Yard in Everett and Chelsea, which is a small yard supporting local customers, including the New England Produce Center. The Commonwealth of Massachusetts acquired the Grand Junction Branch on June 11, 2010.

Pan Am Railways operates trains to Salem in this corridor.

Marine Freight

Marine facilities in the corridor include the East Boston Shipyard and Marina, the Port of Salem, and the Port of Gloucester. There are also private port facilities along the Chelsea River in Chelsea, East Boston, and Revere that handle petroleum products and minerals.

The Port of Salem serves a coal- and oil-fired power plant and an oil storage facility. As of 2007, more than one million tons of coal and three million barrels of oil were delivered annually. The Port of Gloucester is an import and export point for

Canadian and European ports of call. It is a major import center for frozen seafood products and maintains large cold-storage facilities. Work is planned to dredge the harbor to bring water depths from approximately 20 feet to 25 feet. Rail connections are approximately one mile away from the ports of Salem and Gloucester. The East Boston Shipyard and Marina is equipped to repair midsized marine commercial vehicles.

Air Freight

Logan International Airport in East Boston is the region's most important airport for the movement of freight. Among U.S. airports, in 2008 Logan was ranked 14th for the value of international freight it handled. According to data reported by the Bureau of Transportation Statistics; it handled approximately \$14.8 billion worth of freight, with exports accounting for 59% of the total. Logan Airport moved 219,000 tons of freight in 2007.

Many private carriers, including Federal Express and United Parcel Service, operate air cargo facilities at Logan. Intermodal freight to and from Logan is moved by truck. Freight transported by air usually has at least one of the following characteristics: time sensitivity, high value-to-weight ratio, and perishability. There is no freight rail access to Logan Airport, and no provisions for it are likely to develop.

Intermodal Freight Facilities

The intermodal facilities located in the Boston Region MPO portion of the corridor are shown in Figure 2-1 and listed below:

- Wakefield Moving and Storage, Danvers
- Route 1A/Chelsea Creek Petroleum Terminals

There are no intermodal freight facilities located in the corridor outside of the Boston Region MPO area.

Air

Logan International Airport is the region's primary airport. According to the Bureau of Transportation Statistics, in 2008 it was the 19th-busiest airport in the United States, with approximately 11.6 million commercial airline boardings. This represented an 8.4% increase between 1998 and 2008. More than 100 domestic and international destinations are served from the airport with nonstop service.

Access to Logan Airport is greatly facilitated by its location, less than two miles from downtown Boston. Currently, approximately 30 percent of people traveling to or from Logan use public transportation. The MBTA provides transit access to the airport on the Blue Line (Airport Station) and Silver Line, which connects with the Red Line and commuter rail at South Station. Access is also provided by Massport's Logan Express bus service, other private bus service, and water shuttles and water taxis.

The Beverly Municipal Airport is a public airport providing general aviation service in the corridor. It does not handle cargo.

Bicycle

Bicycle Paths

The corridor has four major bicycle paths totaling 13.6 miles: the East Boston Greenway, approximately 1 mile in East Boston; the Independence Greenway Trail, 4.6 miles in Peabody; the Salem Bike Path, approximately 1 mile in Salem; and the Marblehead Rail Trail, 7 miles in Marblehead and Salem.¹ These are shown in Figure 2-1, along with other minor facilities used by bicyclists and pedestrians in the corridor. There are no existing bicycle facilities in the Northeast Corridor that are part of the North Shore Corridor of MassDOT's Bay State Greenway Plan. Currently, slightly more than one of 55 miles of the proposed North Shore Corridor has been constructed.

On-Road Bicycle Accommodations

Table 2-1 shows the percentage of roadways in each of the Boston Region MPO municipalities in the Northeast Corridor that have on-road bicycle accommodations, defined as roadways with bicycle lanes or shoulders of four feet or greater. East Boston is not included in this table but is included in Chapter 8, Central Area.

TABLE 2-1

PERCENTAGE OF ROADWAYS WITH BICYCLE ACCOMMODATIONS

MUNICIPALITY	TOTAL NON-INTER-STATE CENTERLINE MILES	CENTERLINE MILES WITH BICYCLE LANES	CENTERLINE MILES WITH FOUR-FOOT SHOULDERS	PERCENTAGE OF CENTERLINE MILES WITH BICYCLE ACCOMMODATIONS
Beverly	150	0.0	0.0	0.0%
Chelsea	49	0.0	0.0	0.0%
Danvers	124	0.0	2.6	2.1%
Essex	30	0.0	3.1	10.2%
Gloucester	166	0.0	2.3	1.4%
Hamilton	52	0.0	0.0	0.0%
Ipswich	96	0.0	5.5	5.7%
Lynn	171	0.0	1.1	0.6%
Lynnfield	73	0.0	0.0	0.0%
Manchester	39	0.0	0.0	0.0%
Marblehead	77	0.0	0.0	0.0%
Middleton	57	0.0	0.0	0.0%
Nahant	18	0.0	0.0	0.0%
Peabody	172	0.0	3.8	2.2%
Revere	109	0.0	5.0	4.6%
Rockport	41	0.0	0.1	0.2%
Salem	99	0.0	2.2	2.2%
Saugus	110	0.0	3.6	3.2%
Swampscott	46	0.0	0.0	0.0%
Topsfield	59	0.0	4.7	8.0%
Wenham	32	0.0	1.8	5.5%
Winthrop	40	0.0	0.1	0.3%
TOTAL	1,810	0.0	36.0	2.0%

1 The Peabody Bikeway, Salem Bikepath, and Marblehead Rail Trail are also part of the East Coast Greenway that aims to develop a trail system between Canada and Key West.

The bicycle accommodation coverage in the Northeast Corridor is low, varying from no coverage in 9 of the 22 Northeast municipalities to just over 10% coverage in Essex. Overall, the Northeast Corridor, with 2% average coverage, ranks slightly above the regional average of 1.7%.

Bicycle Parking

The MBTA provides bicycle parking at various commuter rail and rapid transit stations in the corridor (see lists of rail stations in the Transit section). According to the MBTA, over 95% of stations now have bicycle parking. Also, the MBTA has secured funding for bike racks on all MBTA buses; therefore, the riders in this corridor will be able to take their bicycles on the bus. The Boston Region MPO has a program funding the installation of bicycle racks in participating municipalities. Municipalities in the corridor that recently installed bike racks funded by the Boston Region MPO are:

- Beverly
- Danvers
- Essex
- Gloucester
- Ipswich
- Marblehead
- Nahant
- Peabody
- Rockport
- Salem
- Saugus
- Swampscott
- Topsfield

Municipalities planning bike rack installations are:

- Chelsea
- Lynn
- Revere

Pedestrian

Table 2-2 shows the percentage of roadways in each of the Boston Region MPO municipalities in the corridor that have sidewalks on at least one side. East Boston is



not included in this table but is included in Chapter 8, Central Area.

TABLE 2-2

PERCENTAGE OF ROADWAYS WITH SIDEWALKS

MUNICIPALITY	TOTAL NON-INTER-STATE CENTERLINE MILES	CENTERLINE MILES WITH SIDEWALKS ON AT LEAST ONE SIDE	PERCENTAGE OF CENTERLINE MILES WITH SIDEWALKS
Beverly	150	89	59%
Chelsea	49	41	84%
Danvers	124	78	63%
Essex	30	6	19%
Gloucester	166	41	25%
Hamilton	52	8	16%
Ipswich	96	15	15%
Lynn	171	131	77%
Lynnfield	73	48	67%
Manchester	39	12	31%
Marblehead	77	41	53%
Middleton	57	17	29%
Nahant	18	11	57%
Peabody	172	118	69%
Revere	109	77	71%
Rockport	41	8	20%
Salem	99	76	77%
Saugus	110	39	35%
Swampscott	46	35	76%
Topsfield	59	12	21%
Wenham	32	6	17%
Winthrop	40	35	87%
TOTALS	1,810	944	52%

The Northeast Corridor has the second-highest sidewalk coverage of all of the radial corridors. The sidewalk coverage varies widely, from 15% coverage in Ipswich to 87% in Winthrop. Overall, the Northeast Corridor, with 52% coverage, ranks above the regional average of 50%.

LAND USE AND DEMOGRAPHICS

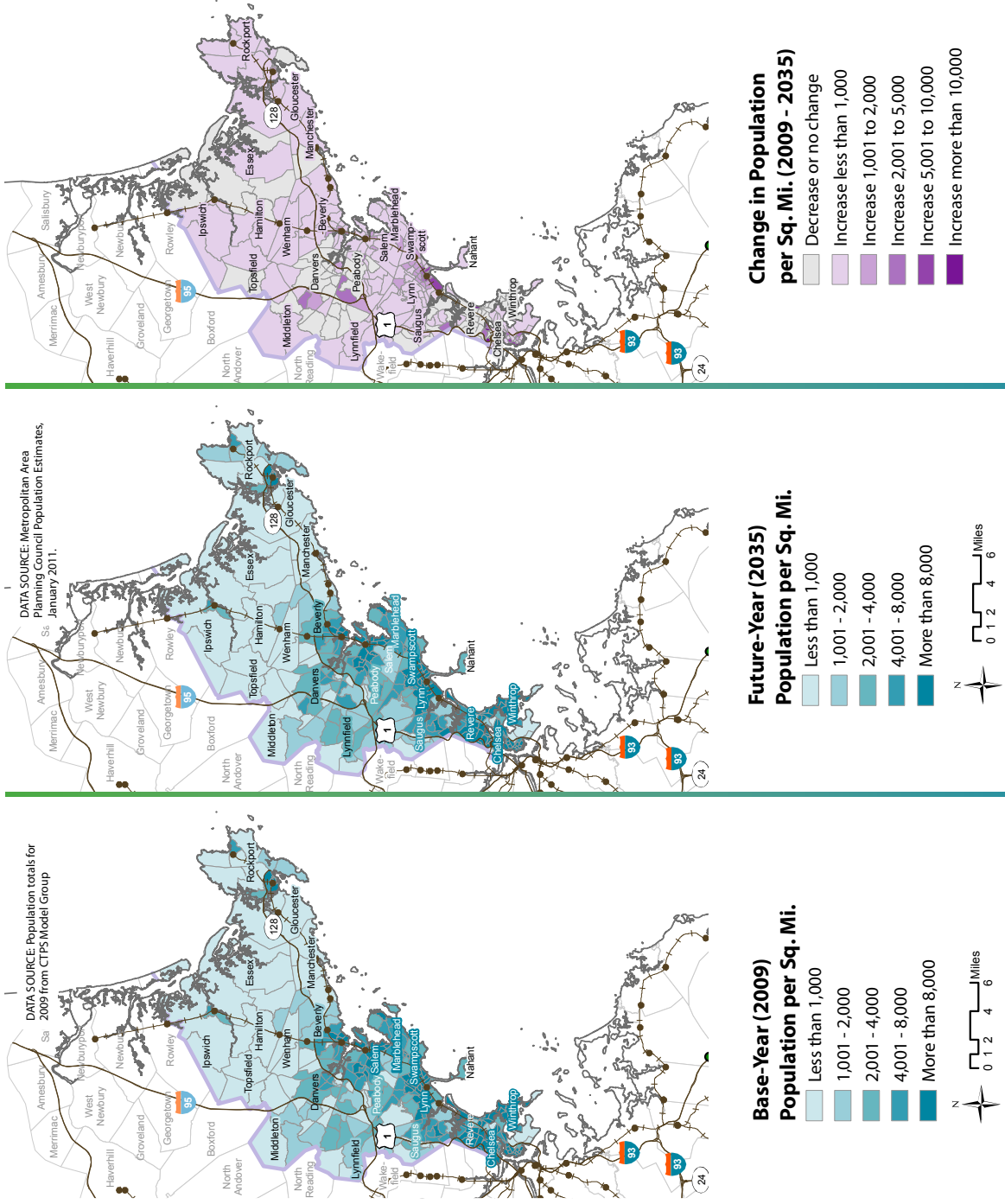
Demographics

Population

The largest densely populated areas in the Northeast Corridor are within Chelsea, Revere, and Lynn. The areas that are projected to become more densely populated between 2009 and 2035 include already-developed areas along the Blue Line and commuter rail. In general, the corridor's population is projected to remain relatively stable, with most municipalities experiencing moderate gains or losses (see Figure 2-3).

FIGURE 2-3

POPULATION DENSITY BY TRANSPORTATION ANALYSIS ZONE – NORTHEAST CORRIDOR



According to U.S. census data (updated annually at the town level), the corridor's 2009 population was 533,890. In the Metropolitan Area Planning Council's (MAPC's) MetroFuture forecasts, the corridor's population increases by 6%, to 566,710, by 2035 (MetroFuture is described briefly below). The municipalities projected to have the largest absolute growth are Lynn, Peabody, Beverly, and Salem.

Figure 2-4 shows, by community for 2009, total elderly (age 70 or higher) population. This information can be used to assess the types of transportation services needed now and in the future. As shown in Figure 2-4, Chelsea and Lynn currently have the highest population of elderly residents.



Land Use, Housing, Sustainable Transportation

As of the year 2000, there were 197,000 housing units in the Northeast Corridor. Of these housing units, 22% were within one-half mile of the Newburyport/Rockport commuter rail line, and 5.5% were within one-half mile of the Blue Line. The highest population densities (2009 data) are found around the Chelsea commuter rail station (32,100 residents per square mile), in downtown Lynn (22,400 residents per square mile), and in downtown Salem (15,700 residents per square mile.)

Figure 2-5 shows transit service and catchment areas with population density in the Northeast Corridor; it includes commuter rail and rapid transit stations along with bus stops. For rapid transit and commuter rail stations, a half-mile

catchment area for walk access is assumed, while the catchment area for bus stops is a quarter mile. This figure shows that higher-density areas in parts of Beverly, Danvers, Marblehead, Revere, and Salem do not have direct access to transit services.

From 2000 to 2009, Northeast Corridor municipalities issued building permits for 11,666 new housing units (according to the U.S. Census Bureau), a 5.9% increase. Five municipalities permitted almost 1,000 units or more: Salem, Danvers, Saugus, Revere, and Peabody. Peabody accounted for nearly 20% of all permits issued, with more than 2,200.

In 2007 and again in 2010, MAPC surveyed municipalities about recent and anticipated development. The largest recent developments in the corridor include Brooksby Village in Peabody, an over-55 development of more than 1,500 units. Peabody also saw more than 750 units in the Fairfield and Avalon developments. Overlook Ridge in Revere (on the Malden border) includes 625 housing units,

FIGURE 2-4

ELDERLY POPULATION BY TOWN, 2009 – NORTHEAST CORRIDOR

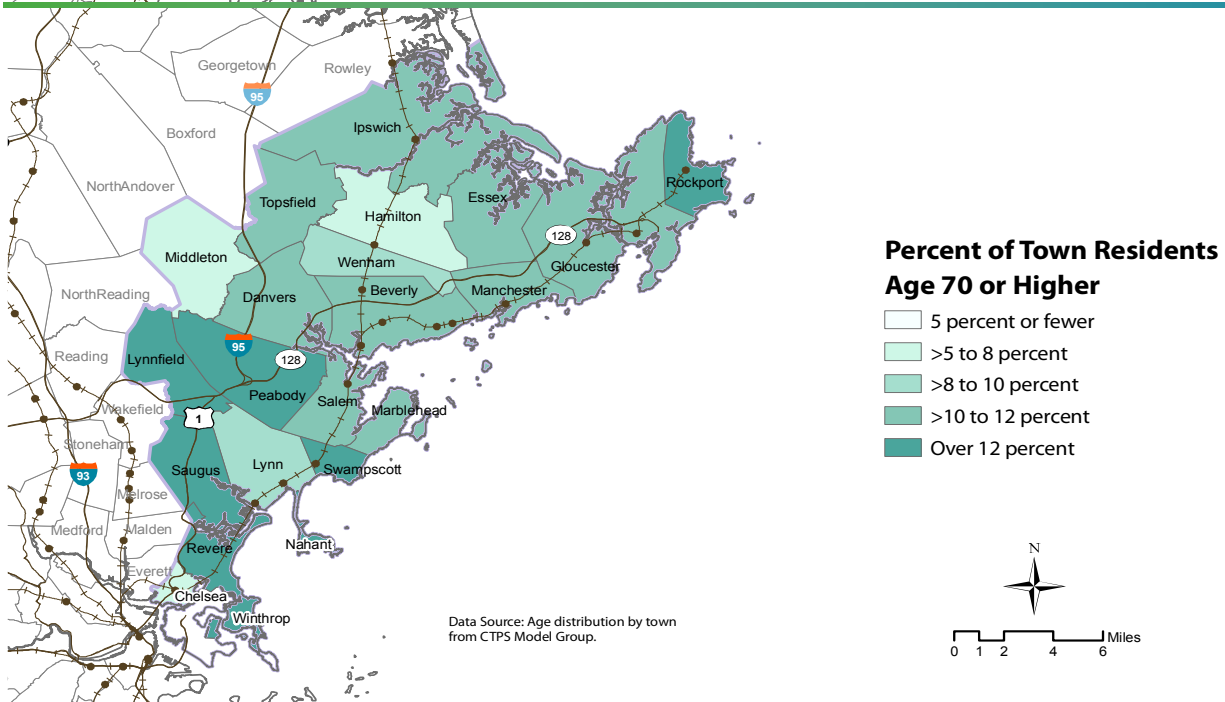
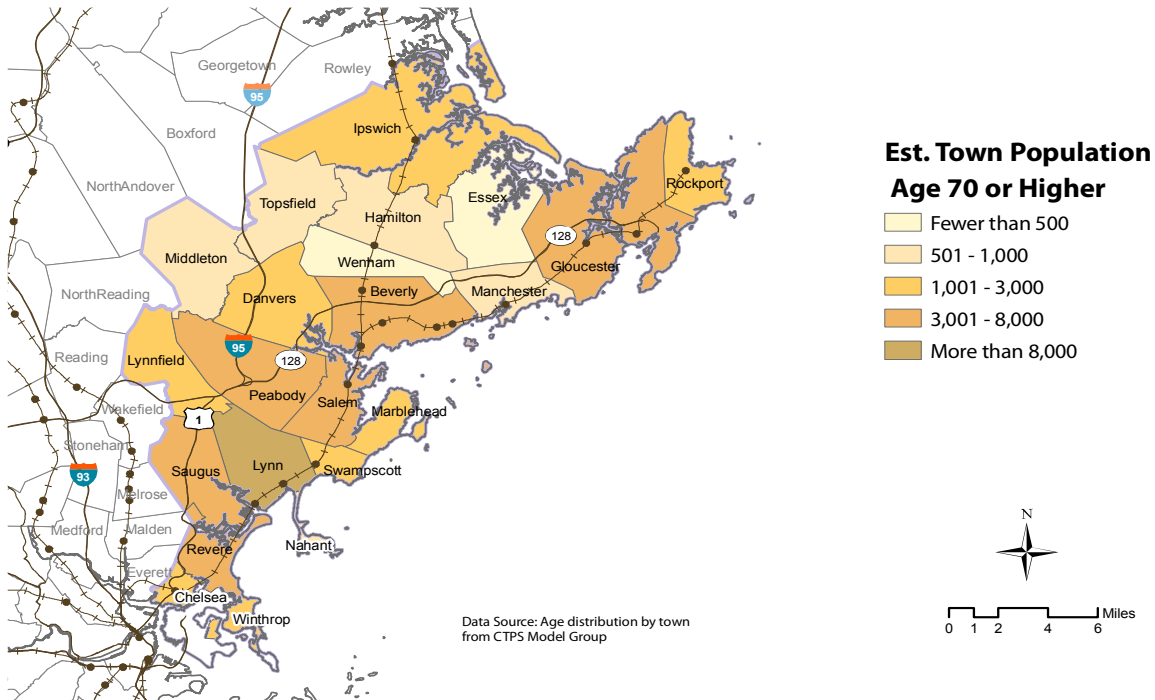
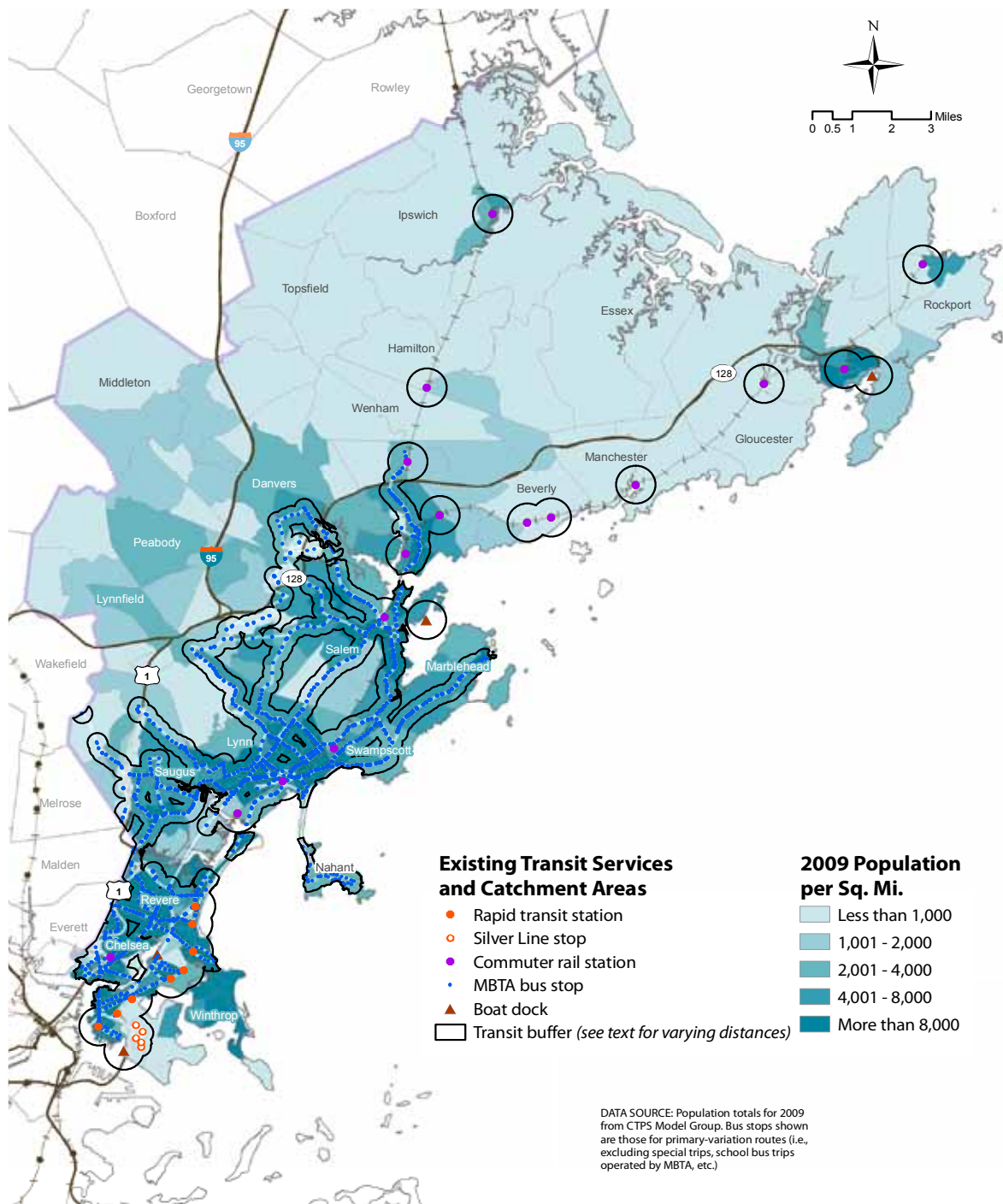


FIGURE 2-5

EXISTING TRANSIT TRANSPORTATION FACILITIES – NORTHEAST CORRIDOR



and the Avalon development recently completed in Danvers includes nearly 500 units of housing. The largest development currently planned in the corridor is the redevelopment of the Lynn waterfront into a mixed-use center including up to 3,500 housing units and 2 million square feet of retail, office, and hotel space. The next largest development planned is the Wonderland transit-oriented development in Revere, which includes 750 housing units, a 100-room hotel, and more than 175,000 square feet of commercial and retail space.

In 2010, MAPC conducted a planning study of six municipalities in the Northeast Corridor to identify priority development areas (PDAs) and priority preservation areas (PPAs). The PDAs identified through that process included downtown Salem, downtown Beverly, Sohier Road in Beverly, downtown Danvers, the Hamilton-Wenham commuter rail station, and Ipswich town center, among others.

Auto ownership is slightly above the regional average, at 1.6 autos per household, while the average household drives 45.9 miles per day, slightly below the regional average. These rates vary widely, however, with daily household mileage above 75 miles per day in Middleton (84 miles per day) and Topsfield (77 miles per day); in both of those towns, the average household owns more than two cars. Household mileage also exceeds 65 miles per day in Essex, Lynnfield, Wenham, Hamilton, and Ipswich. Households in Chelsea, Winthrop, Revere, Lynn, and Salem are on the other end of the spectrum, with fewer than 1.4 vehicles per household and fewer than 37 miles driven per household per day.

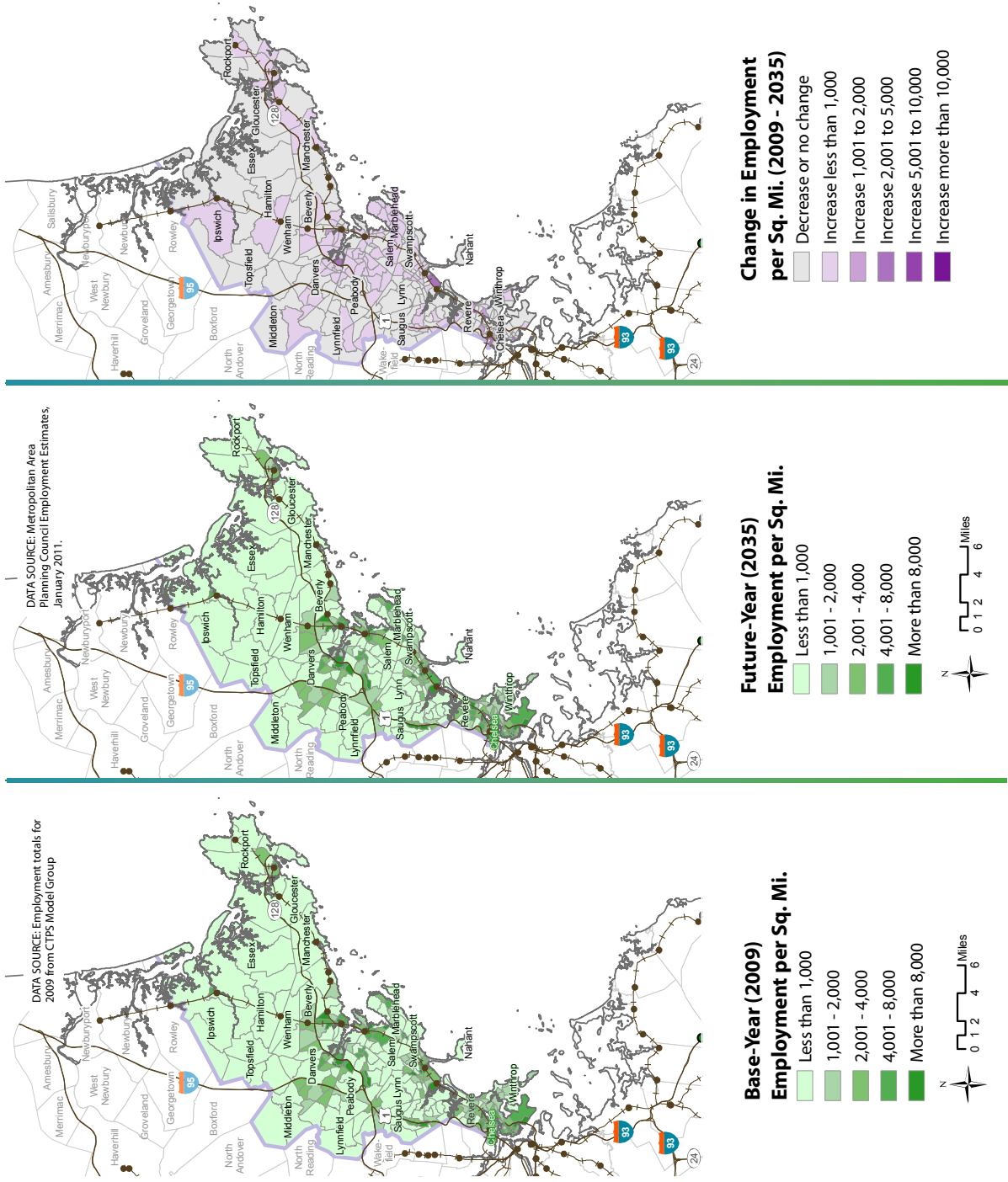
Employment

According to the Executive Office of Labor and Workforce Development, the number of jobs in the Northeast Corridor in 2009 was 186,700. Nearly half of these jobs are in Danvers, Peabody, Lynn, and Beverly, each of which had average employment over 20,000 in 2009. Salem, Chelsea, Gloucester, and Saugus, each with over 10,000 jobs, account for another 25% of total employment. Danvers and Peabody generate the largest number of auto commuting miles: more than 165,000 auto miles per day combined, equal to 35% of the corridor total. In addition to large numbers of employees, these municipalities have above-average commute distances for employees (>14 miles round-trip, versus 9.0 corridor average). Among the top eight employment locations listed above, Saugus, Gloucester, Salem, and Chelsea have the most efficient commutes, with commute distances below the corridor average and more than 10% of commuting miles traveled by transit (versus 9.5% corridor-wide.)

MAPC's MetroFuture forecasts show employment increasing by 3% to 194,110 by 2035, with some municipalities experiencing modest growth in absolute terms. The largest employment gains are projected to occur through: implementation of the Lynn waterfront development plan and Wonderland TOD; redevelopment and densification of office and industrial parks in Beverly, Peabody, and Danvers; and urban development and revitalization in Gloucester, Chelsea, and Salem. Smaller employment gains (10% or less of the corridor total) are projected for Lynnfield and Saugus. Ipswich, Manchester, and Marblehead are projected to add fewer than 300 net new jobs.

FIGURE 2-6

EMPLOYMENT DENSITY BY TRANSPORTATION ANALYSIS ZONE – NORTHEAST CORRIDOR



MetroFuture Plan

MetroFuture is a long-range plan for land use, housing, economic development, and environmental preservation in the Boston region comprising both a vision for the region's future and a set of strategies to achieve that future. The MetroFuture land use plan and associated socioeconomic projections are used in the MPO's travel demand model. MetroFuture seeks to create a more sustainable future for the region by focusing growth in areas where development already exists in order to make better use of existing infrastructure and reduce the need for new highways, interchanges, and other infrastructure.

MetroFuture classified municipalities into four distinct community types based on existing conditions and potential for sustainable development. The Northeast Corridor includes three Inner Core communities (Chelsea, Revere, and Winthrop) and five Regional Urban Centers (Beverly, Gloucester, Lynn, Peabody, and Salem). The remaining towns are Maturing Suburbs or Developing Suburbs.

The MetroFuture land use vision for the Northeast Corridor is built around redevelopment of commercial and industrial land along the Blue Line, along the Newburyport/Rockport commuter rail line, and in urban centers. In these locations, new households will have the greatest access to transit and the highest proximity to common household destinations.

Economic development along the Blue Line and near commuter rail stations will also create more options for commuters, especially if transit service is structured to serve reverse commutes from the Inner Core to suburban job locations near transit. In locations more distant from transit, MetroFuture recommends land use, design, and transportation demand strategies that facilitate access to transit and bicycle or pedestrian improvements.

Municipal Planning

Most municipalities in the corridor have adopted or opted in to contemporary planning initiatives and other planning activities that promote economic development, smart growth, healthy transportation, and greenhouse gas (GHG) emission reductions. Participating municipalities along with their programs and municipality designations, are shown in Table 2-3. A description of these programs is provided in Appendix B.

The MPO does not have direct control over land use decisions; land use is controlled by local municipalities through zoning. However, the MPO can use the information presented here in its decision making when choosing projects to fund in the LRTP and Transportation Improvement Program (TIP). Projects can be ranked based on how well the community is implementing the smart growth and healthy transportation initiatives in addition to whether a project reduces GHG emissions.

TABLE 2-3

MUNICIPAL PLANNING: COMMUNITY CHECKLIST

MUNICIPALITY	ECONOMIC DEVELOPMENT			SMART GROWTH							LAND USE			PUBLIC HEALTH		CLIMATE CHANGE		
	PWED	Approved 43D Site	TMA	TOD & Housing Support	Approved 40R District	Regional Hub	Suburban Center	Urban Center	Maturing Suburb	Growth Districts Initiative	District Local Tech. Asst.	TOD District	Mixed Use Zoning District	Comm. Preservation Act	Mass In Motion	Safe Routes to School	WCW	ICLEI Member
Beverly	•		•			•		•		•	•	•				•		
Chelsea		•	•	•	•					•		•			•	•		
Danvers			•			•		•		•		•						
Essex	•									•			•		•			
Gloucester	•	•				•	•			•		•		•	•			
Hamilton													•					•
Ipswich	•											•				•	•	
Lynn	•		•	•		•	•	•				•						
Lynnfield					•			•							•			
Manchester	•												•		•			
Marblehead	•							•		•					•			
Middleton													•					
Nahant								•										
Peabody			•			•	•			•		•	•		•			
Revere	•	•							•	•		•		•				
Rockport	•											•	•		•	•		
Salem	•		•			•				•	•	•					•	•
Saugus								•		•					•	•		
Swampscott								•		•					•			
Topsfield																		
Wenham													•					•
Winthrop	•									•		•						

TRAVEL CHARACTERISTICS

Travel into Boston Proper from the Northeast Corridor (Highway and Transit)

The most recent count information for highway and transit travel into Boston Proper from the Northeast Corridor is shown in Table 2-4. Also included is the same information from the travel demand model showing projected future 2030 No-Build conditions. Highway and transit trips were assigned to the corridor from which they enter Boston Proper, rather than assigning them to the corridor in which they originate. Boston Proper is the area with the following boundaries:

- Charles River on the north
- Massachusetts Avenue to Interstate 93 on the west and south
- Interstate 93 to South Station on the east

TABLE 2-4

AVERAGE DAILY HIGHWAY AND TRANSIT PERSON-TRIPS INTO BOSTON PROPER FROM THE NORTHEAST CORRIDOR: 2008 AND 2030 NO-BUILD

	2008 PERSON-TRIPS	2030 NO-BUILD PERSON-TRIPS
Highway	54,830	55,660
Transit	40,050	42,920
Total	94,880	98,580
Highway percentage	58%	56%
Transit percentage	42%	44%
Corridor's share of total person-trips into Boston	10%	9%

Table 2-5 gives the modal breakdown of the transit trips.

TABLE 2-5

AVERAGE DAILY TRANSIT PERSON-TRIPS BY MODE INTO BOSTON PROPER FROM THE NORTHEAST CORRIDOR: 2008 AND 2030 NO-BUILD

	2008 PERSON-TRIPS	2030 NO-BUILD PERSON-TRIPS
Bus	6,530	7,550
Rapid transit	26,700	28,210
Commuter rail	6,520	7,160
Contracted bus service	300	0
Ferry	0	0
TOTAL	40,050	42,920
Corridor's share of total transit trips into Boston	11%	11%

Inbound congestion levels on each of the three major modes of transit entering Boston Proper from the Northeast Corridor were calculated via two methods: by comparing the ridership loads to the seating capacity and by comparing them to the planning capacity (planning capacity is the seating capacity plus standing capacity). The 2008 congestion levels for each mode are shown in Table 2-6.

TABLE 2-6

AVERAGE DAILY CONGESTION LEVELS ON TRANSIT MODES WITH SERVICE INTO BOSTON PROPER FROM THE NORTHEAST CORRIDOR (2008)

MODE	BY SEATING CAPACITY	BY PLANNING CAPACITY
Bus	64%	41%
Rapid transit	30%	13%
Commuter rail	68%	57%

More detailed information on both highway and transit congestion is included in the Identified Transportation Issues section under Mobility.

Northeast Corridor Travel Patterns

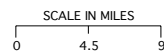
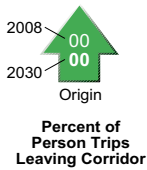
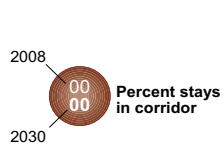
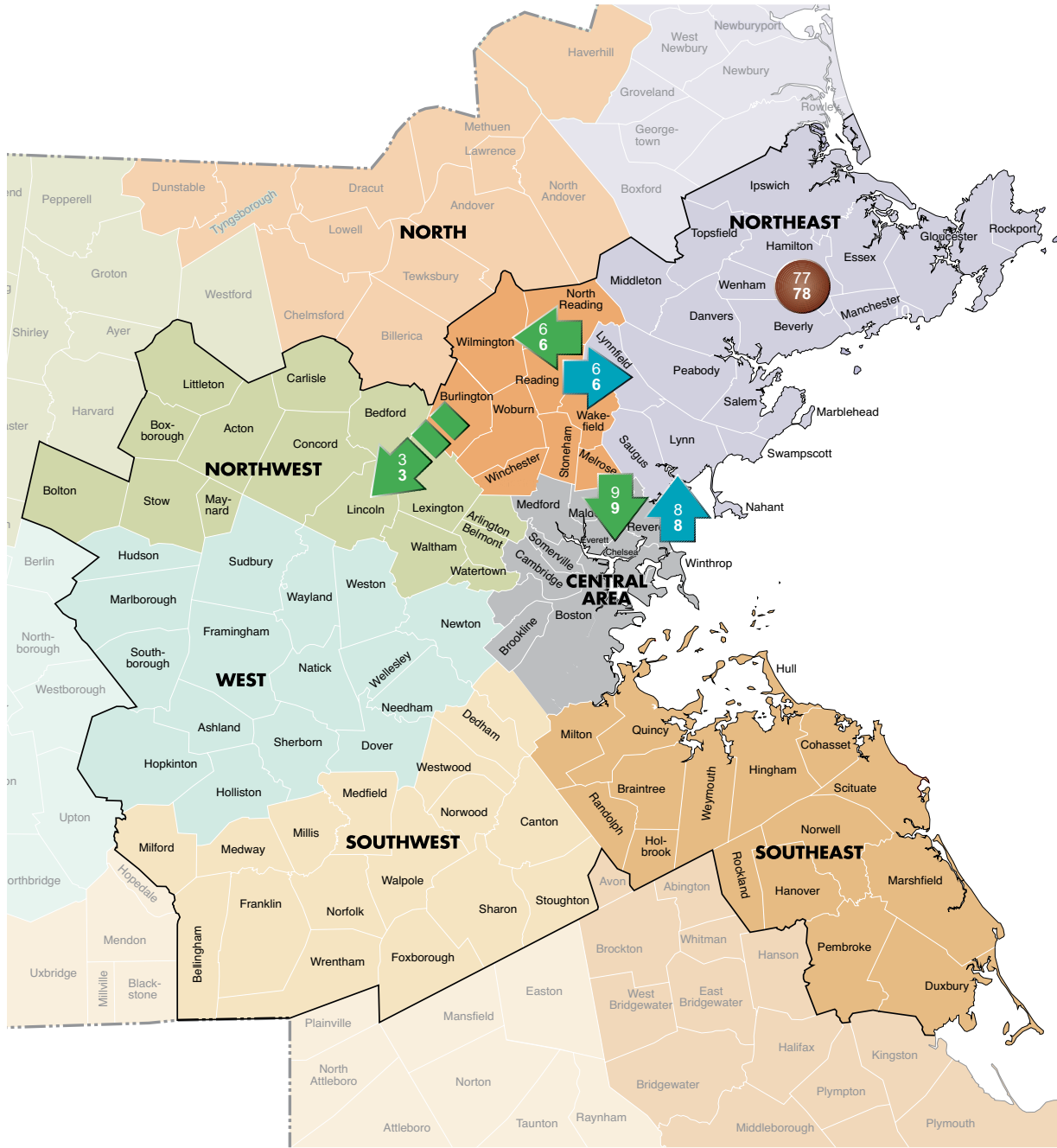
Figure 2-7 presents data, for both the base year 2008 and the projected 2030 No-Build scenario, on the person-trips (highway and transit combined for all types of travel: work-based, school-based, shopping, etc.) that originate in and are destined to the inner Northeast Corridor – the corridor communities that are not part of the Central Area. The 2030 No-Build assumes the realization of the projected MetroFuture population and employment with the existing transportation network. This information was developed using the travel demand model.

As shown, 77% of person-trips in the 2008 base year and 78% of person-trips in the 2030 No-Build scenario remain in the inner Northeast Corridor (municipalities within the Boston Region MPO that are not part of the Central Area). The other top origins and destinations for travel in the inner Northeast Corridor are the North and Northwest corridors and the Central Area. The Central Area is the region’s most prominent population and employment area, and it includes the Northeast Corridor municipalities of Revere, Chelsea, and Winthrop and the Boston neighborhood of East Boston. Approximately 9% of person-trips in the corridor originate in or are destined to the Central Area. In comparing 2008 base-year and 2030 No-Build travel, the latter includes slightly more travel within the inner Northeast Corridor. Travel within the Northeast Corridor and between it and the previously listed corridors accounts for 95% of all person-trips associated with the Northeast Corridor. The remaining 5% of person-trips travel to the remaining corridors.

When looking at the 2000 census Journey-to-Work data for the Northeast Corridor, only 59% of the work-based trips (compared to 77% of all trips) remain within the Northeast Corridor, while almost 19% of the work-based trips (compared to 9% of all trips) are destined to the Central Area.

FIGURE 2-7

TRAVEL ASSOCIATED WITH THE NORTHEAST CORRIDOR
(2008 AND 2030 PERSON-TRIPS)





Truck Travel

Daily truck trip-ends per square mile are shown in Figure 2-8 along with the locations of freight intermodal facilities. This figure shows that the highest concentrations of 2008 daily truck activity occur close to Boston Proper in Chelsea, East Boston, and Revere and in the central areas of Lynn, Salem, Beverly, and Gloucester. Other areas with high levels of truck travel include Route 1 in Saugus and Danvers, along Route 128 in Danvers and Peabody, Route 114 in Danvers and Peabody, and Route 1A in Salem and Beverly.

Between 2008 and 2030 (No-Build scenario), the truck model predicts that the largest increases in truck travel will

occur in East Boston along the waterfront, in Lynn along the waterfront, and along Route 1A near Route 128 in Beverly.

Bicycle and Pedestrian Travel

There are limited bicycle facilities and bicycle travel in the Northeast Corridor. Approximately 2% of the non-interstate centerline miles provide bicycle accommodations. Similarly, less than 1% of Northeast Corridor residents bicycle to work (data derived from 2000 census Journey-to-Work data).

Walking conditions vary from poor to very good in the Northeast Corridor. Table 2-7 shows the relationship between roadway sidewalk coverage (roadways having a sidewalk on at least one side) and percentage of resident workers that walk to work by community. (Walk-to-work data are derived from 2000 census Journey-to-Work data.²) This table indicates the range in sidewalk coverage from 15% in Ipswich to 87% in Winthrop and in walk share from under 1% in Middleton to over 21.5% in Chelsea. The town of Wenham, with a walk share of 47%, was classified as an outlier and not included in Table 2-7 because its sample size was too low to be considered valid.

² It should be noted that these percentages are estimates based on a U.S. Census Bureau questionnaire. Only workers over 16 years of age are included. All students, including those over 16, are excluded. These data were collected in early spring, when, according to metropolitan Boston counts, bicycle volumes are about one-quarter of the peak-season volumes. It is not known what the seasonal variations are for pedestrians, but pedestrian volumes are assumed to be less variable than bicycle volumes. Another factor to consider is that the census questionnaire asks for the mode used for the longest part of the trip to work. A trip comprising a two-mile bicycle trip to a rail station, a five-mile train trip, and a half-mile walk to the workplace, for example, would be classified as a rail trip.

FIGURE 2-8

DAILY TRUCK TRIPS BY TRANSPORTATION ANALYSIS ZONE – NORTHEAST CORRIDOR

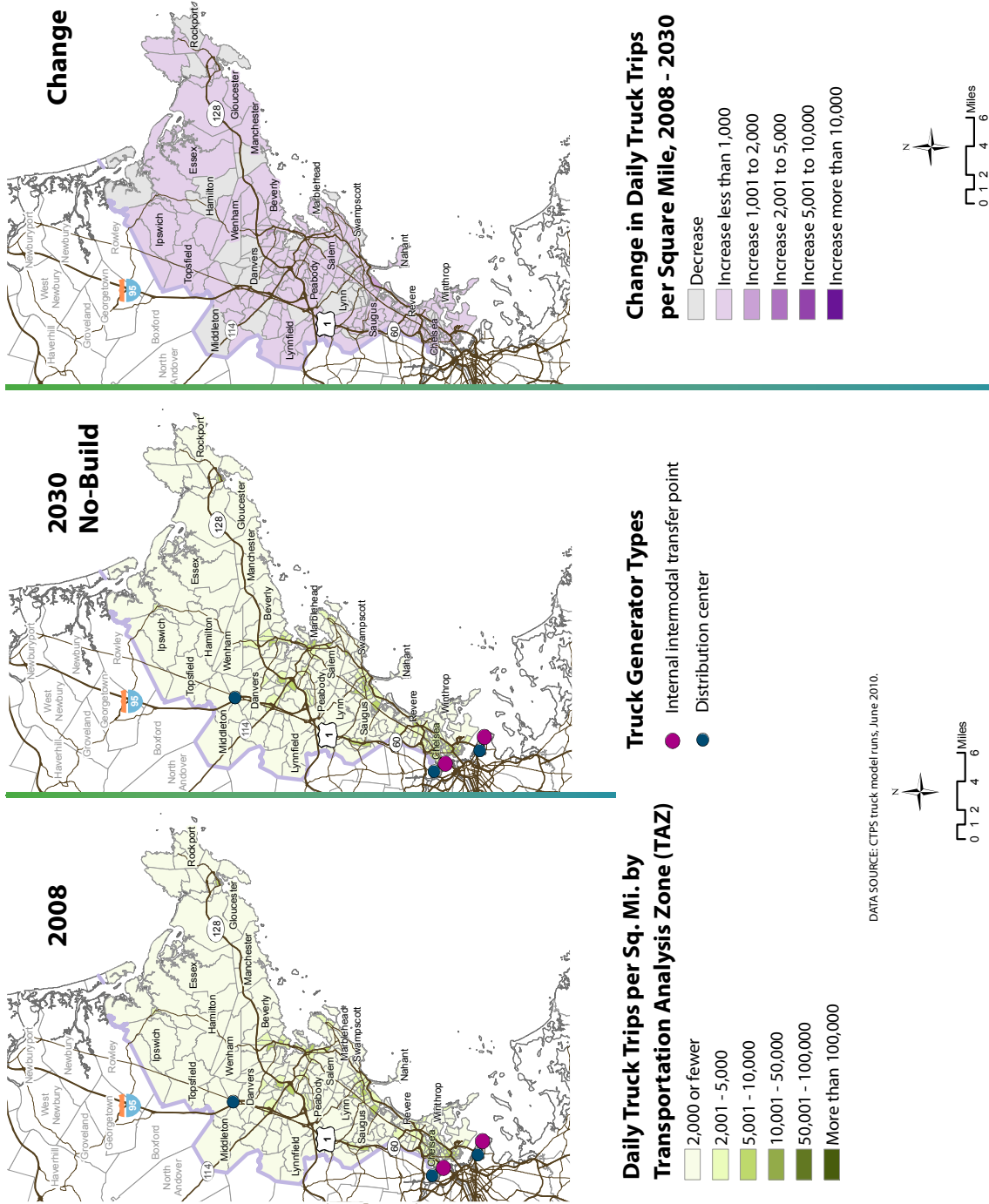
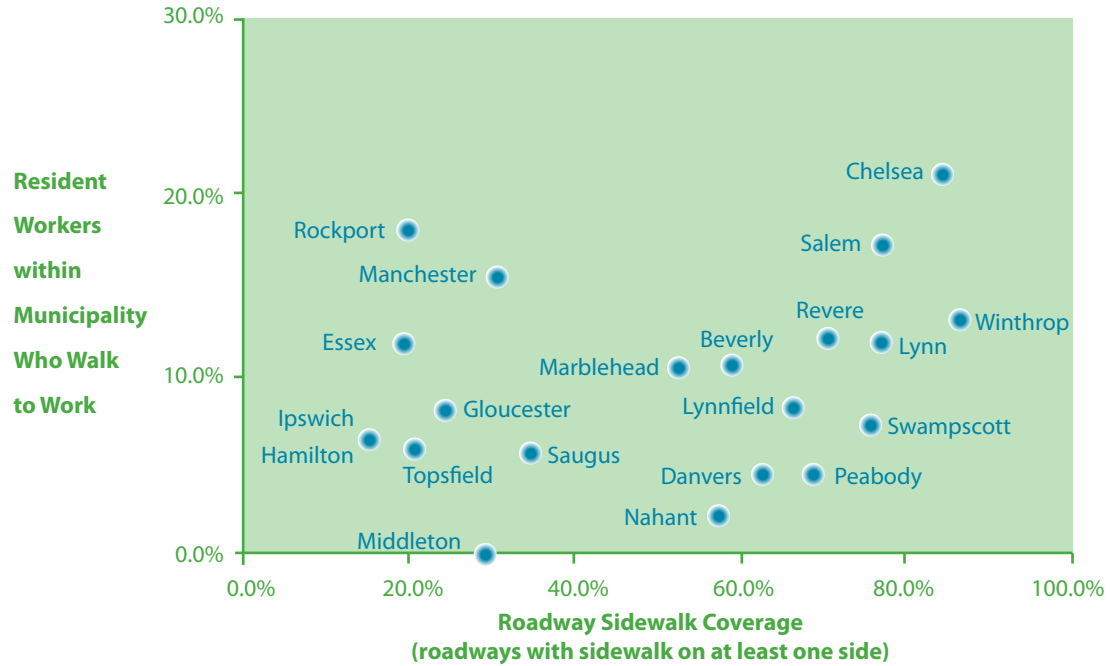


TABLE 2-7

RELATIONSHIP BETWEEN SIDEWALK COVERAGE AND RESIDENT WORKERS WITHIN MUNICIPALITY WHO WALK TO WORK



Bicyclists and pedestrians have been counted at several on-road facilities and one off-road facility in the Northeast Corridor. Table 2-8 contains the top counted locations by average weekday peak-hour user volumes. Users primarily consist of bicyclists and pedestrians, and also include people jogging, skating, using wheelchairs, and pushing strollers.

TABLE 2-8

AVERAGE PEAK-HOUR BICYCLIST AND PEDESTRIAN VOLUMES

FACILITY NAME	AM WEEKDAY PEAK-HOUR VOLUMES		
	BICYCLISTS	PEDESTRIANS	TOTAL
Broadway (Chelsea)	4	324	328
Arlington St. (Chelsea)	3	189	192
North St. (Salem)	0	130	130
Marblehead Rail Trail (Marblehead)	11	19	30
Lafayette St. (Salem)	10	11	21
FACILITY NAME	PM WEEKDAY PEAK-HOUR VOLUMES		
	BICYCLISTS	PEDESTRIANS	TOTAL
Cabot St. (Beverly)	23	240	263
Broadway (Chelsea)	5	210	215

(CONT.)

TABLE 2-8 (CONT.)

AVERAGE PEAK-HOUR BICYCLIST AND PEDESTRIAN VOLUMES

FACILITY NAME	PM WEEKDAY PEAK-HOUR VOLUMES (CONT.)		
	BICYCLISTS	PEDESTRIANS	TOTAL
North St. (Salem)	0	164	164
Spruce St. (Chelsea)	16	131	147
Washington St. (Lynn)	20	74	94
Maple St. (Danvers)	14	59	73
Main St. (Peabody)	2	25	27
FACILITY NAME	DAILY WEEKEND PEAK-HOUR VOLUMES		
	BICYCLISTS	PEDESTRIANS	TOTAL
Marblehead Rail Trail (Marblehead)	8	7	15

IDENTIFIED TRANSPORTATION ISSUES

System Preservation and Modernization Issues

Highway

Roadways

The Boston Region MPO area is the most densely populated MPO area in the state. The condition of its roadways is under constant pressure from high traffic volumes and harsh weather conditions. Because of this and the advanced age of much of the infrastructure, the roadways require significant preservation activities. Pavement needs were not calculated at the corridor level but have been calculated for the MPO region as a whole. That information is provided in Chapter 10.

Bridges

Condition: In Massachusetts, the condition of bridges is categorized through a nationally adopted rating system based on a number of standards, including structural adequacy, safety, serviceability, traffic, and public use. The system assigns one of three classifications to a bridge, based on its condition: 1) meeting standards, 2) functionally obsolete, and 3) structurally deficient. Functionally obsolete means that the bridge fails to meet current traffic demands or highway standards on bridge width, traffic volume, or condition of approach roadways. Inclusion in this category does not necessarily mean there is an imminent safety concern. Structurally deficient means that deterioration has reduced the load-carrying capacity of the bridge and is an indication that reconstruction may be necessary. Of the 293 bridges in the Northeast Corridor, 62 (21%) are classified as functionally obsolete, and 25 (8.5%) are classified as structurally deficient.

Vertical Clearance: The desired vertical clearance for trucks on highways as outlined in the 2006 Massachusetts Highway Department Project Development and Design Guide is 16 feet and 6 inches. This allows for the larger truckloads that are becoming more prevalent. There are 131 bridges in the corridor that should meet this vertical



clearance for trucks. Of these bridges, 104 (79%) do not meet this standard.

Highway Bridge Weight Restrictions: Closed bridges and weight-restricted bridges cost truckers time and money due to increased fuel consumption, longer delivery times, and other inefficiencies. There are 29 (10%) weight-restricted bridges in the Northeast Corridor.

Transit: Universe of Transit Preservation and Modernization Needs Identified for the Northeast Corridor in the MBTA's Program for Mass Transportation

The MBTA's Program for Mass Transportation (PMT) approved in December 2009 provides information on current and proposed transit needs. Some of the major transit needs or issues regarding system preservation and modernization in the Northeast Corridor are as follows:

State-of-Good-Repair Projects

A number of system preservation projects must be undertaken in the short- to mid-term to bring the system into a state of good repair and to ensure the safety of passengers and reliability of service.

On the Newburyport/Rockport Line one drawbridge needs upgraded electrical controls.

On the Blue Line, power substation equipment and an outdated signal system are in need of replacement. The overhead catenary system and track and switches at some locations also need to be replaced.

On the bus system, the Charlestown garage needs a new roof and air conditioning system, and the bus storage facility at the Lynn garage needs to be refurbished.

Infrastructure Enhancements

In order to continue to maintain and improve service quality as demand grows and as technologies and materials improve, the MBTA will need to continually invest in infrastructure enhancements.

ADA Accessibility

Some gaps remain in providing ADA accessibility. The following stations are not accessible:

- Chelsea (Newburyport/Rockport Line)
- Prides Crossing (Rockport Line)

Freight

Weight-Restricted Tracks

The tracks in the Northeast Corridor are restricted to 263,000 pounds per train car. The industry standard has become 286,000 pounds. This increases costs for all shippers who need more cars to move their freight than they would in areas with 286,000-pound tracks.

Dredging

An Army Corps of Engineers feasibility study has recommended dredging the entrance channel to the Port of Boston to a depth of 50 feet. The Boston Harbor Deep Draft Navigation Project also calls for deepening the Chelsea River Channel to 40 feet to provide better freight access.

Dredging is needed in the Port of Gloucester around the Jodrey State Fish Pier and various other areas of the harbor to support the fishing industry and cruise ships.

Mobility

Highway Bottlenecks: Method for Identifying Them

A highway bottleneck is defined as a location where a constraint impedes the flow of traffic and can affect various types of roadways. The constraint at a bottleneck can be caused by, among other things, close spacing of intersections operating near or at capacity, a lane drop, or the confluence of large volumes of traffic at an interchange connecting two major highways. The types of roadways included in this bottleneck analysis are:

1. Express highways, which are multilane, divided highways with fully controlled limited access
2. Class I and II arterials, which are defined as higher-speed arterials (those with some degree of limited access) and partially limited-access highways
3. The remainder of the arterial roadway network, which is classified as Urban Street Class III

Bottlenecks on express highways and arterials can be identified using a number of methods. For identifying those in the Northeast Corridor, three types of data that the Boston Region MPO collects or produces for express highways and arterials have been used:

- Travel speed index during peak periods (existing conditions for express highways and Class I and II arterials)
- Volume-to-capacity ratio during peak periods (existing and future conditions for express highways and all arterials)
- Intersections given priority by the Congestion Management Process (CMP) for improvement (existing conditions for Class III arterials)

Information of each type for the Northeast Corridor is presented in the following three subsections. Based on that information, the worst bottlenecks in the corridor were identified; these are listed in the subsequent section.

Travel Speed Index (from the CMP)

Congestion thresholds have been established for express highways and Class I and II arterials using existing travel speed index data and are used in this identification of bottlenecks. The speed index is the ratio of observed speed to the posted speed limit.

The locations on express highways and Class I and II arterials that have the worst speed indexes are shown in Table 2-9 for the AM peak period and Table 2-10 for the PM peak period, and also in Figures 2-9 and 2-10. Note that the tables include only Class I and II arterials; however, Figure 2-10 also shows Class III arterials. Many of the locations shown in Figure 2-10 with a travel speed index below 40% are CMP priority intersections on Class III arterials and are also discussed below in the CMP Priority Intersections section and shown in Figure 2-15. The AM and PM peak periods referred to in the tables and figures are defined as follows. For express highways, the AM peak period is from 6:00 AM to 10:00 AM and the PM peak period is from 3:00 PM to 7:00 PM. For arterials the AM peak period is from 6:30 AM to 9:30 AM, and the PM peak period is from 3:30 PM to 6:30 PM. The travel speed index information is provided for existing conditions only.

TABLE 2-9

**TRAVEL SPEED INDEX (FROM THE CMP):
WORST LOCATIONS* IN AM PEAK PERIOD**

EXPRESS HIGHWAYS	SPEED INDEX
Rte. 1 southbound (Peabody to Chelsea)	0.49 to 0.82
Rte. 1 northbound (Chelsea to Malden)	0.65 to 0.92
Rte. 1 northbound (Peabody)	0.9
CLASS I & II ARTERIALS	SPEED INDEX
Rte. 1A southbound from Oak Island to Bell Circle (Revere)	0.36 to 0.63
Rte. 1A/60 southbound from Logan on-ramp to Sumner toll booths (Boston)	0.45
Rte. 1A/60 southbound from the U-turn signal to Boardman St. (Boston)	0.48
Rte. 1A southbound from the Lynnway stop sign to Kingman St. (Lynn)	0.52
Rte. 1A northbound from Kingman St. to Market St. (Lynn)	0.60

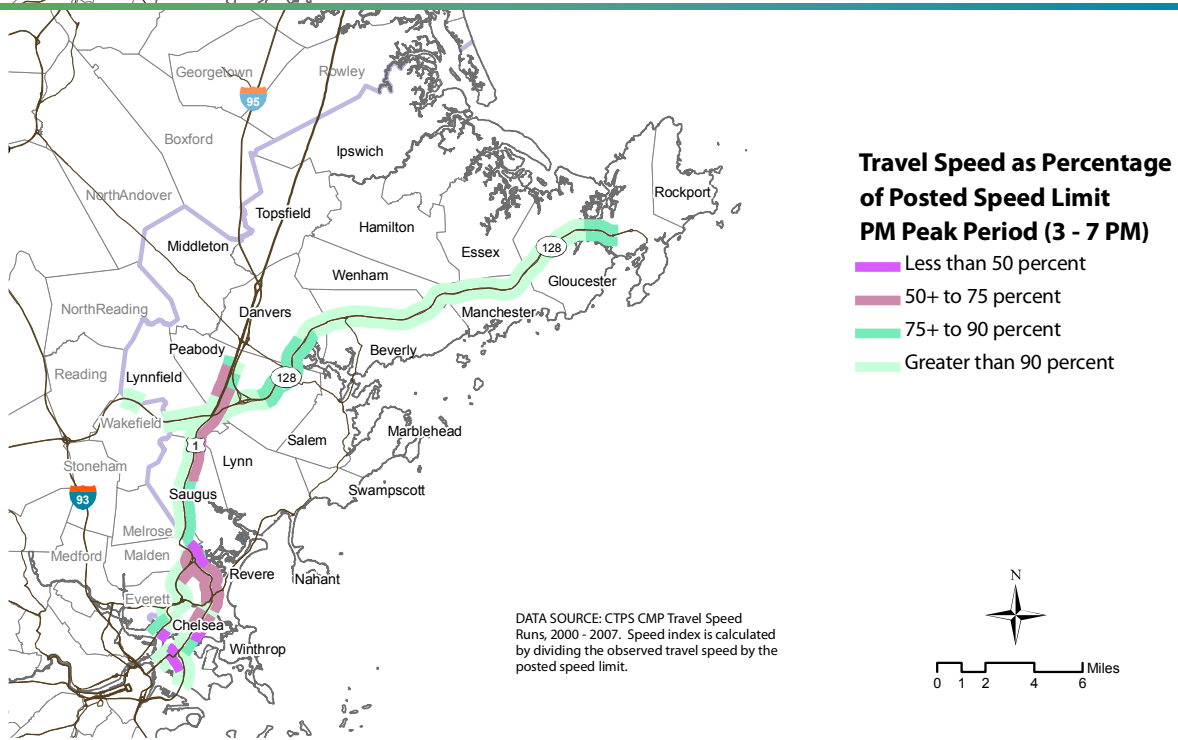
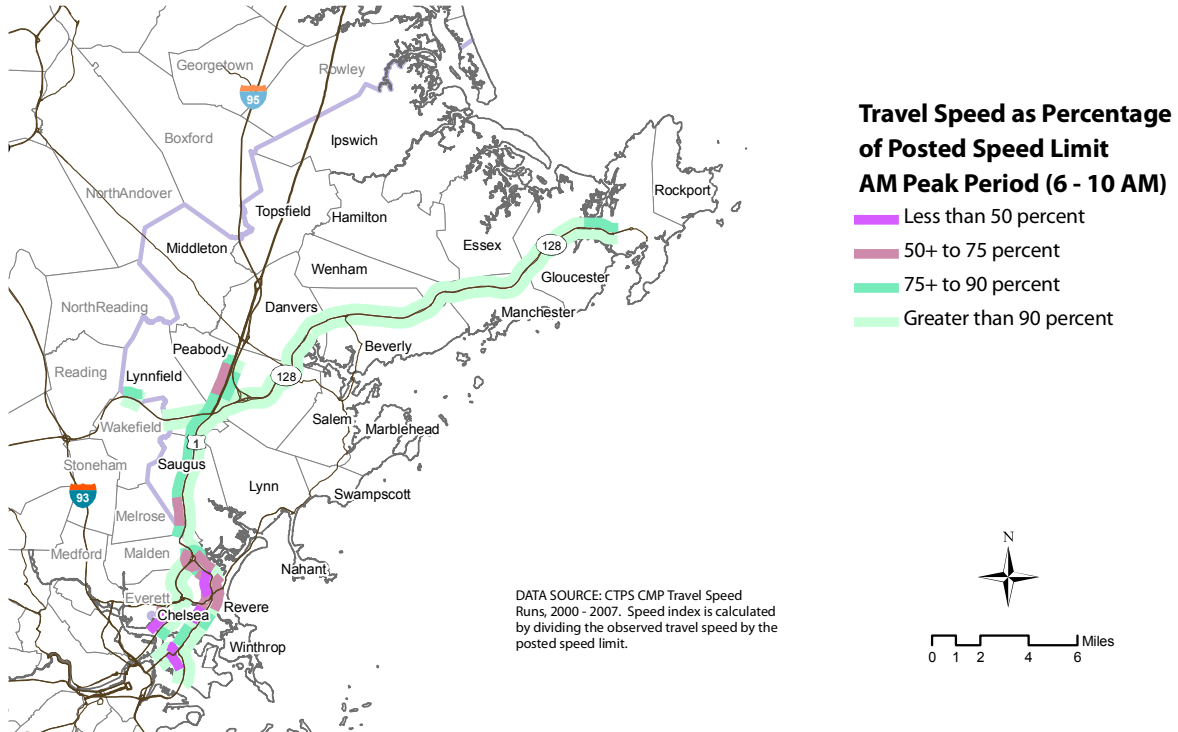
TABLE 2-10

**TRAVEL SPEED INDEX (FROM THE CMP):
WORST LOCATIONS* IN PM PEAK PERIOD**

EXPRESS HIGHWAYS	SPEED INDEX
Rte. 1 northbound (Chelsea to Peabody)	0.47 to 0.84
Rte. 1 southbound (Malden to Chelsea)	0.52 to 0.75
Rte. 1 southbound (Peabody)	0.62 to 0.9
Rte. 128 northbound and southbound (Peabody and Danvers)	0.79 to 0.84
Rte. 128 northbound and southbound between Grant Circle and Crafts Rd. (Gloucester)	0.83
Rte. 128 southbound between Endicott St. and Rte. 114 (Peabody)	0.84
CLASS I & II ARTERIALS	SPEED INDEX
Rte. 1A Oak Island Road to Bell Circle (Revere)	0.09 to 0.81
Rte. 1A/60 southbound Logan on-ramp to Sumner toll booths (Boston)	0.40
Rte. 1A/60 northbound Curtis St. on-ramp to Boardman St. (Boston)	0.48
Rte. 1A North northbound from the first signal in Lynn to Hanson St. (Lynn)	0.56

FIGURE 2-9

**EXPRESS HIGHWAY TRAVEL SPEED INDEX (EXISTING CONDITIONS) – AM AND PM:
NORTHEAST CORRIDOR**



Volume-to-Capacity Ratio

The existing volume-to-capacity ratios (V/Cs) of express highway and arterial segments in the Northeast Corridor were calculated using the roadways' existing traffic volumes and capacities. The V/C is an indication of the operational quality of a roadway segment. A roadway is reaching capacity as the V/C begins to approach 1.

Table 2-11 and Figures 2-11 and 2-12 present the segments of roadways in the Northeast Corridor with the highest V/Cs during the AM peak period, listed in descending order of severity. Table 2-12 and Figures 2-11 and 2-12 present the same information for the PM peak period. Order of severity was determined based on all data points and is therefore not always reflected in the ranges shown in the tables. In these tables and figures, for both the express highways and arterials, the AM peak period is from 6:00 AM to 9:00 AM and the PM peak period is from 3:00 PM to 6:00 PM.

TABLE 2-11

**VOLUME-TO-CAPACITY RATIO (V/C):
WORST LOCATIONS IN AM PEAK PERIOD, 2008**

EXPRESS HIGHWAYS	V/C
I-90 northbound (Ted Williams Tunnel)	0.74
I-95 southbound in Peabody, Lynnfield, Wakefield	0.55 to 0.79
I-95 northbound in Wakefield and Lynnfield	0.60 to 0.64
ARTERIALS	V/C
Rte. 1A McClellan Highway to Albert J. Brown Circle in Revere (Boston, Revere)	0.77 to greater than 1
Rte. 1 in Danvers to Rte. 1 in Chelsea	0.74 to greater than 1
Rte. 129 in Marblehead to 1A in Lynn	0.72 to greater than 1
Rte. 127 in Rockport and Gloucester	0.73 to greater than 1
Rte. 62 in Danvers and Beverly	0.78 to greater than 1

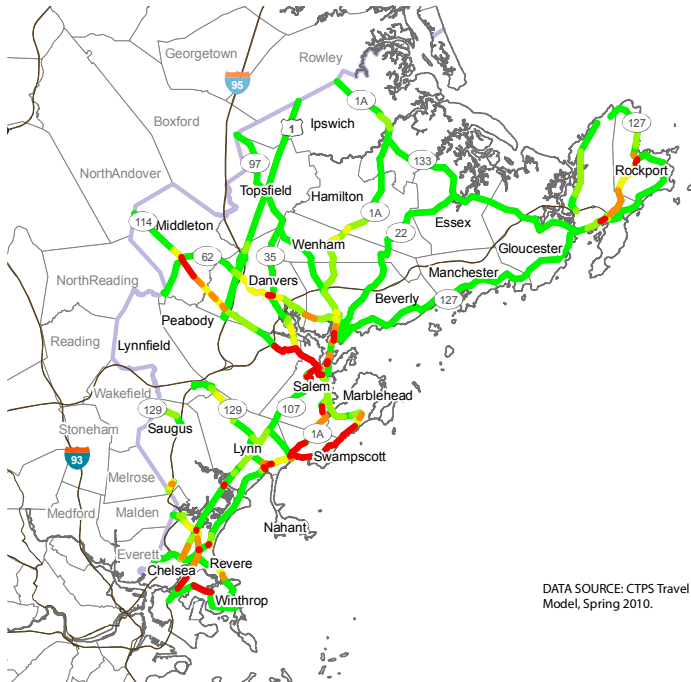
TABLE 2-12

**VOLUME-TO-CAPACITY RATIO (V/C):
WORST LOCATIONS IN PM PEAK PERIOD, 2008**

EXPRESS HIGHWAYS	V/C
I90 northbound Ted Williams Tunnel to intersection with East Boston Expressway	0.87 to 0.98
I-95 northbound in Wakefield and Lynnfield	0.84 to 0.93
ARTERIALS	V/C
Rte. 127 in Rockport and Gloucester	Greater than 1
Rte. 129 in Marblehead and Swampscott to 1A in Lynn	0.99 to greater than 1
Rte. 107 Broadway in Revere south of Albert J. Brown Circle	0.98 to greater than 1
Rte. 1A in Beverly and Salem	0.96 to greater than 1
Rte. 114 in Peabody and Salem	0.96 to greater than 1

FIGURE 2-12

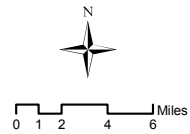
ARTERIAL VOLUME-TO-CAPACITY RATIO – 2008, AM AND PM:
NORTHEAST CORRIDOR



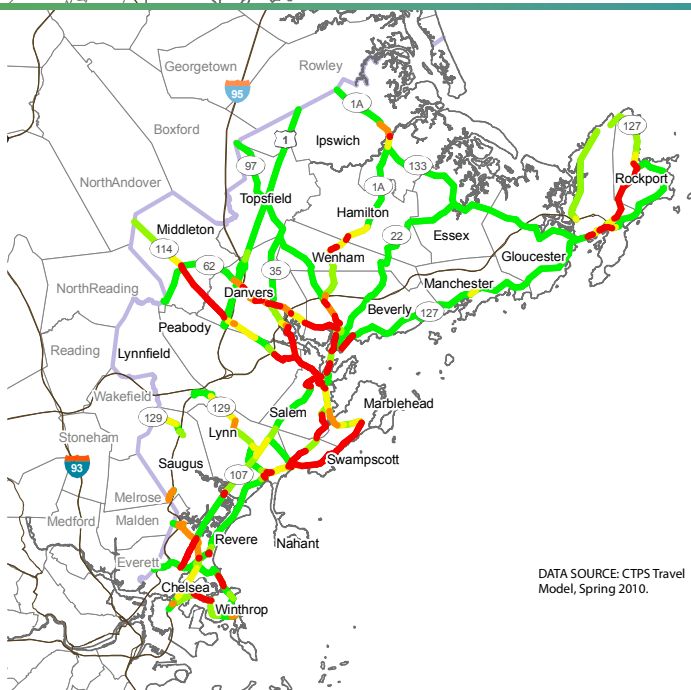
**Volume-to-Capacity Ratio:
AM Peak Period (6 - 9 AM)**

- Less than 0.60
- > 0.60 to 0.80
- > 0.80 to 0.90
- > 0.90 to 1.00
- Greater than 1.00

NOTE: Value shown is for the **peak direction** on each arterial, based on model output, not field observations.



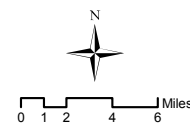
DATA SOURCE: CTPS Travel Model, Spring 2010.



**Volume-to-Capacity Ratio:
PM Peak Period (3 - 6 PM)**

- Less than 0.60
- > 0.60 to 0.80
- > 0.80 to 0.90
- > 0.90 to 1.00
- Greater than 1.00

NOTE: Value shown is for the **peak direction** on each arterial, based on model output, not field observations.



DATA SOURCE: CTPS Travel Model, Spring 2010.

In addition, the Boston Region MPO's travel demand model was used to determine V/C for roadways under 2030 No-Build conditions. Table 2-13 and Figures 2-13 and 2-14 present the segments of roadways in the Northeast Corridor with the highest AM peak period V/Cs under the 2030 No-Build, again listing them in descending order of severity. Table 2-14 and Figures 2-13 and 2-14 present the same information for the PM peak period. Order of severity was determined based on all data points and is therefore not always reflected in the ranges shown in the tables. In this V/C analysis, arterials are not broken down by classification.

TABLE 2-13

**VOLUME-TO-CAPACITY RATIO (V/C):
WORST LOCATIONS IN AM PEAK PERIOD, 2030 NO-BUILD**

EXPRESS HIGHWAYS	V/C
I-90 northbound (Ted Williams Tunnel)	0.74
I-95 southbound in Peabody, Lynnfield, Wakefield	0.59 to 0.78
I-95 northbound in Wakefield and Lynnfield	0.62 to 0.65
I-95 southbound in Danvers	0.59
ARTERIALS	V/C
Rte. 129 in Marblehead and Swampscott to 1A in Lynn	0.78 to greater than 1
Rte. 1A McClellan Highway (Boston) to Albert J. Brown Circle in Revere	0.78 to greater than 1
Rte. 127 in Rockport and Gloucester	0.75 to greater than 1
Rte. 1 in Danvers to Rte. 1 in Chelsea	0.74 to greater than 1
Rte. 114 in Middleton and Danvers	0.73 to greater than 1

TABLE 2-14

**VOLUME-TO-CAPACITY RATIO (V/C):
WORST LOCATIONS IN PM PEAK PERIOD, 2030 NO-BUILD**

EXPRESS HIGHWAYS	V/C
I-90 northbound Ted Williams Tunnel to East Boston	0.87 to 0.98
I-95 northbound in Wakefield and Lynnfield	0.74 to 0.93
ARTERIALS	V/C
Rte. 127 in Rockport and Gloucester	Greater than 1
Rte. 114 in Peabody and Salem	Greater than 1
Rte. 129 in Marblehead and Swampscott to 1A in Lynn	Greater than 1
Rte. 107 Broadway in Revere south of Albert J. Brown Circle	0.97 to greater than 1
Rte. 1A in Revere	0.97 to greater than 1

CMP Priority Intersections

The CMP identifies the intersections in the region that, on the basis of certain criteria, should be given priority for receiving improvements. An intersection is categorized as a priority if it meets at least one of the following criteria: it has a

FIGURE 2-13

EXPRESS HIGHWAY VOLUME-TO-CAPACITY RATIO – 2030 NO-BUILD, AM AND PM:
NORTHEAST CORRIDOR

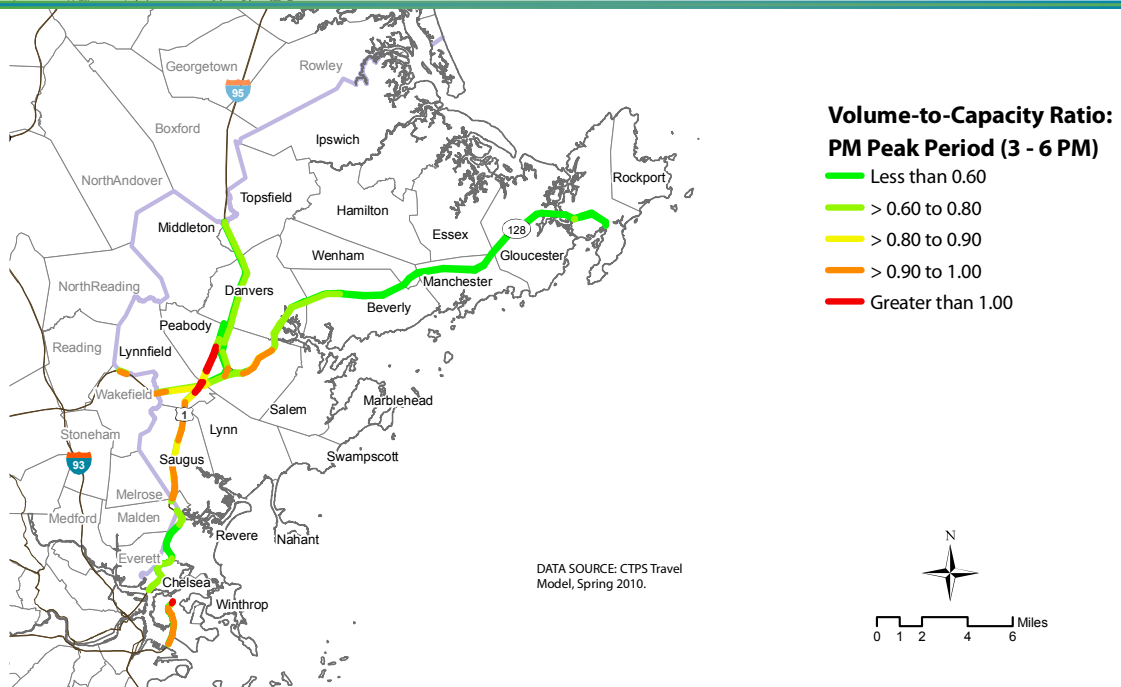
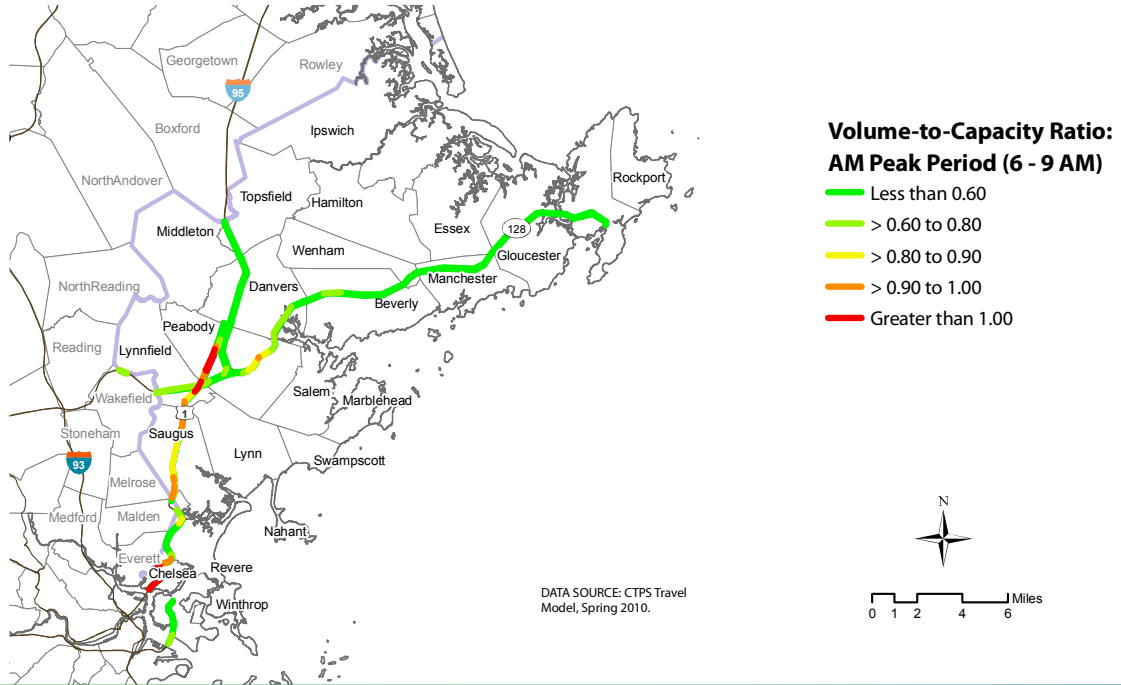
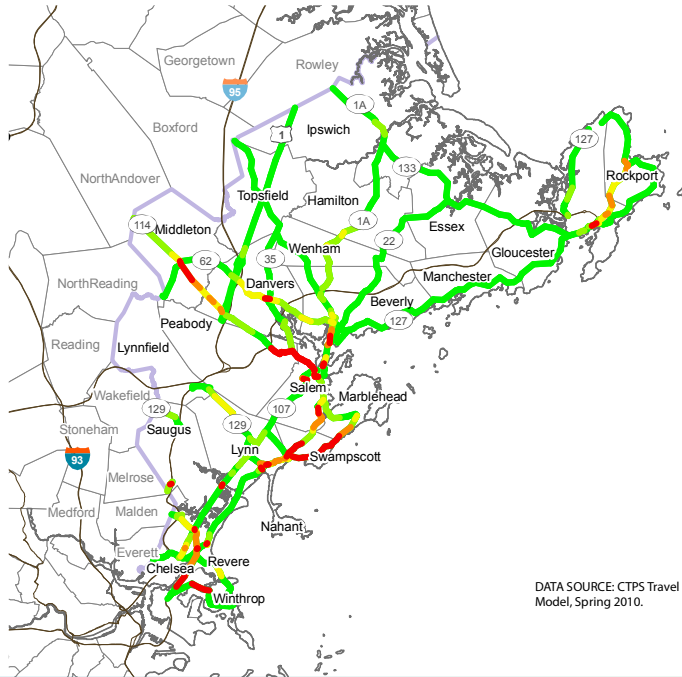


FIGURE 2-14

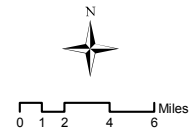
ARTERIAL VOLUME-TO-CAPACITY RATIO – 2030 No-BUILD, AM AND PM:
NORTHEAST CORRIDOR



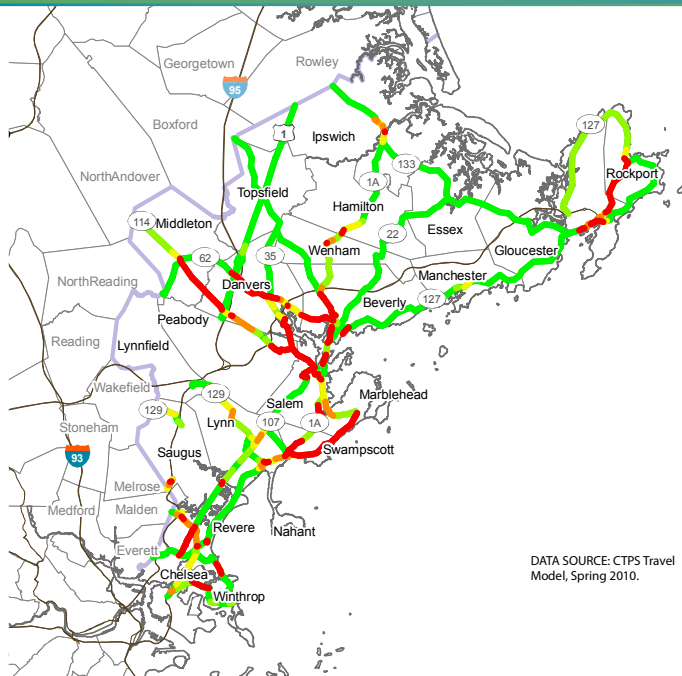
**Volume-to-Capacity Ratio:
AM Peak Period (6 - 9 AM)**

- Less than 0.60
- > 0.60 to 0.80
- > 0.80 to 0.90
- > 0.90 to 1.00
- Greater than 1.00

NOTE: Value shown is for the **peak direction** on each arterial, based on model output, not field observations.



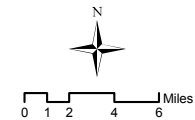
DATA SOURCE: CTPS Travel Model, Spring 2010.



**Volume-to-Capacity Ratio:
PM Peak Period (3 - 6 PM)**

- Less than 0.60
- > 0.60 to 0.80
- > 0.80 to 0.90
- > 0.90 to 1.00
- Greater than 1.00

NOTE: Value shown is for the **peak direction** on each arterial, based on model output, not field observations.



DATA SOURCE: CTPS Travel Model, Spring 2010.

high incidence of crashes, the average delay on its major approaches is greater than 80 seconds per vehicle as monitored by the CMP (all state-numbered routes are monitored), or it has been identified in an MPO study as needing improvement.

The Northeast Corridor intersections that have been given priority by the CMP are shown in Figure 2-15. The roadways in the corridor that have clusters of priority intersections are (in roughly geographical order):

- Route 129 in Lynn and Swampscott
- Route 62 in Danvers and Beverly
- Route 114 in Marblehead and Danvers
- Route 107 in Lynn and Salem
- Boston Street in Lynn
- Route 1A in Revere and Beverly
- Route 60 in Revere
- Route 1 in Chelsea
- Route 16 in Chelsea
- Everett Street in Chelsea

Many of the clusters of priority intersections are on Class III arterials with the worst travel speed indexes (as determined by the CMP).

Worst Highway Bottlenecks in the Northeast Corridor

Table 2-15 shows the locations that have been identified as the worst bottlenecks in the Northeast Corridor, based on the three types of information presented above. This table identifies the criteria by which the location was identified as a bottleneck.

TABLE 2-15

WORST BOTTLENECK LOCATIONS

EXPRESS HIGHWAYS	SPEED INDEX	VOLUME TO CAPACITY	PRIORITY INTERSECTIONS
Rte. 1, Chelsea to Danvers	•	•	•
Rte. 128 exit between Grant Circle and Crafts Rd., Gloucester	•		
Rte. 128 northbound and southbound between Lowell St. and Rte. 114 (Peabody and Danvers)	•		
Rte. 128 southbound between Endicott St. and Rte. 114 (Peabody)	•		
I-90 northbound, Ted Williams Tunnel		•	
I-95 southbound in Peabody, Lynnfield, and Wakefield		•	
I-95 northbound in Wakefield and Lynnfield		•	

(CONT.)

TABLE 2-15 (CONT.)

WORST BOTTLENECK LOCATIONS

ARTERIALS	SPEED INDEX	VOLUME TO CAPACITY	PRIORITY INTERSECTIONS
Rte. 1A in from Boston to Danvers	•	•	•
Rte. 62 in Danvers and Beverly		•	•
Rte. 16 in Chelsea			•
Rte. 60 in Revere			•
Rte. 107 in Revere, Lynn, and Salem		•	•
Rte. 114 in Danvers to Marblehead		•	•
Rte. 127 in Rockport and Gloucester		•	
Rte. 129 in Marblehead, Swampscott, and Lynn		•	•
Everett St. in Chelsea			•

Transit Mobility Needs Identified by the MBTA for the Northeast Corridor

Various factors affect transit mobility, including capacity issues related to vehicle loads, service reliability, infrastructure and/or vehicle condition, and parking availability. Also affecting mobility is connectivity among modes and with other RTAs, private-carrier services, and TMA shuttles.

Vehicle Load and Service Reliability Issues

The ratio of passengers to seats on a vehicle is an indication of whether or not additional capacity is needed on a rail line or bus route. The MBTA’s Service Delivery Policy defines acceptable vehicle loads by mode and by time period. The maximum allowable ratio of riders to seats on buses is 140% during peak travel periods and 100% during the off-peak. For light and heavy rail, the peak and off-peak maximum ratios of riders to seats varies according to the configuration of the various types of cars. For commuter rail, the vehicle load standard is set for peak periods at 110% and for the off-peak at 100%.³

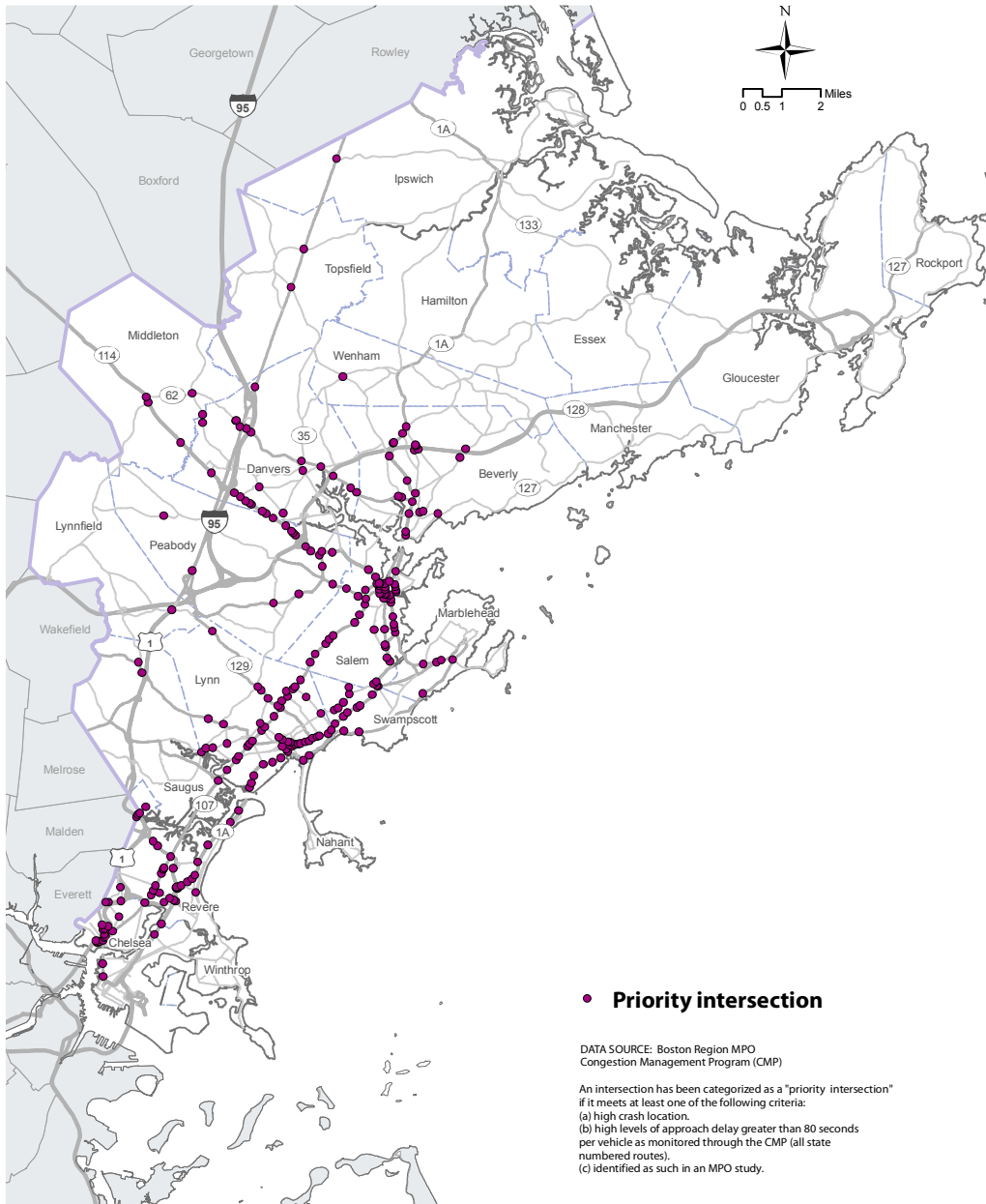
The Blue Line modernization program, which included accessibility improvements, platform extensions to accommodate six-car train operations, and the purchase of new vehicles, increased the effective carrying capacity of the line by 50%.⁴ Operation of six-car trains began in 2008, and the most recent passenger counts available show that the Blue Line meets its vehicle load standard of an average of no more than 95 passengers per car at the peak load points in the AM and PM peaks.

3 For bus, light rail and heavy rail, the vehicle load standard is based on the ratio of passengers to seated capacity at maximum load for each trip, averaged over 30 minutes during the peaks and 60 minutes during off-peak periods. For commuter rail and ferry services, the load standard is based on the ratio of boarding passengers per vehicle to seated capacity.

4 MBTA Program for Mass Transportation, December 2009, p. 2-4.

FIGURE 2-15

CMP PRIORITY INTERSECTIONS – NORTHEAST CORRIDOR



Recent data also show that none of the commuter rail trips on the Newburyport and Rockport lines exceed the vehicle load standards. Tables 2-16 and 2-17 show the peak-period vehicle load ratios for the Newburyport and Rockport lines, respectively.

TABLE 2-16

NEWBURYPORT LINE VEHICLE LOADS

INBOUND AM PEAK							
Arrive North Station	6:27 AM	7:00 AM	7:38 AM	8:06 AM	8:25 AM*	8:46 AM*	9:00 AM
Assigned Seats	570	570	684	798	570	570	570
Peak Load	283	460	677	717	328	334	446
Peak Load/Seats	50%	81%	99%	90%	58%	59%	78%
OUTBOUND PM PEAK							
Depart North Station	4:25 PM	4:45 PM	5:10 PM	5:40 PM	5:55 PM*	6:45 PM	
Assigned Seats	684	570	570	798	570	570	
Peak Load	445	299	424	560	404	304	
Peak Load/Seats	65%	52%*	74%	70%	17%	53%	

* Hamilton/Wenham and Beverly short-turn trains.

TABLE 2-17

ROCKPORT LINE VEHICLE LOADS

INBOUND AM PEAK				
Arrive North Station	6:16 AM	7:19 AM	7:52 AM	8:33 AM
Assigned Seats	570	570	798	570
Peak Load	257	478	812	478
Peak Load/Seats	45%	84%	102%	84%
OUTBOUND PM PEAK				
Depart North Station	4:00 PM	5:00 PM	5:25 PM	6:10 PM
Assigned Seats	570	570	798	570
Peak Load	318	477	511	431
Peak Load/Seats	56%	84%	64%	76%

The buses with the highest ridership in the Northeast Corridor are:

- Route 111 (Woodlawn - Haymarket Station) - 8,700 average daily boardings
- Route 116 (Wonderland Station - Maverick Station) - 4,400 average daily boardings
- Route 117 (Wonderland Station - Maverick Station via Beach) - 4,100 average daily boardings
- Route 120 (Orient Heights - Maverick Station) - 2,700 average daily boardings

Table 2-18 presents data on the performance of the Northeast Corridor bus routes. As shown by the routes' maximum load ratios (based on recent ridership counts), two routes in the Northeast Corridor fail the load standard, Routes 117 and 430. Service adjustments have been made on both routes to try to alleviate the problems. Table 2-18 also shows the number of trips and percent of scheduled trips on each bus route serving the Northeast Corridor that were operated during the month of October 2010. These columns give an indication of which routes operate with a high frequency of service and the degree to which scheduled trips are not run.

In addition, Table 2-18 lists the percent of timepoints on each route (for all trips operated during October) at which the buses were on time, and gives an indication of whether or not the route might pass the schedule adherence standard. In the *Service Delivery Policy*, the schedule adherence standard establishes a two-step process. First, the standard measures whether or not the bus is on time at various timepoints along the route. The definition of "on time" at any given timepoint on a route varies by time period and by the frequency of service and depends on whether the timepoint is at the beginning of the route, mid-route, or at the end of the route. Second, a requirement that 75% of trips be "on time" is applied to individual time periods, and a route fails the standard if it fails during any time period during the day.

In Table 2-18, the 75% threshold has been applied to all timepoints on all trips operated during the month of October 2010, and so the result is not an official schedule adherence designation. It does, however, give an idea of how well individual routes are performing and provides a comparative indication of which routes have the worst problems and are most in need of operational improvements. The MBTA now employs various types of monitoring systems, including real-time vehicle locators and electronic passenger counters, to generate data that can be used to improve service reliability. MBTA Service Planning is currently using automatic vehicle locator (AVL) data to refine bus schedules to better represent actual running times. This should improve on-time performance.

Bus schedule adherence can be affected by various factors, most notably the level of traffic on the roadway. However, the size and condition of the fleet also affect service reliability and capacity. A sufficient number of vehicles must be available to operate the regular service with spare vehicles to cover breakdowns and other unusual events. The generally accepted industry standard for spare vehicles is 20% of the active bus fleet. Currently, the spare ratio for buses systemwide and at the Lynn garage (out of which most of the bus routes in the corridor operate) meet this spare ratio standard. The current bus fleet is fairly new and in good condition, as is indicated by the measure of mean miles between vehicle failures. The MBTA's November 2010 ScoreCard (which reports on performance during the months of June through October 2010) shows the mean miles between failures for the bus fleet to be 12,437 in October. This greatly exceeded the goal of 6,000.

TABLE 2-18

PERFORMANCE OF BUS ROUTES

					BASED ON ALL TRIPS OPERATED DURING OCTOBER 2010			
TYPE	ROUTE	ROUTE NAME	VEHICLE LOAD STANDARD	MAXIMUM LOAD RATIO	% TIME-POINTS ON TIME*	SCHEDULE ADHERENCE STANDARD*	% OF SCHEDULED TRIPS OPERATED	# TRIPS OPERATED
Local	110	Wonderland Sta. - Wellington Sta.		121%	65%	Fail	98.9%	930
Local	111	Woodlawn - Haymarket Sta.		153%	79%		97.2%	3392
Local	112	Wellington Sta. - Wood Island Sta.		65%	59%	Fail	100.0%	504
Local	114	Bellingham Sq. - Maverick Sta.		98%	64%	Fail	99.5%	188
Local	116	Wonderland Sta. - Maverick Sta.		133%	60%	Fail	99.4%	1385
Local	117	Wonderland Sta. - Maverick Sta. via Beach	Fail	150%	61%	Fail	99.5%	993
Local	119	Northgate Shopping Ctr. - Beachmont Sta.		88%	59%	Fail	99.9%	525
Local	120	Orient Heights Sta. - Maverick Sta.		121%	61%	Fail	99.4%	1,001
Local	121	Wood Island Park Sta. - Maverick Sta.		76%	85%		99.7%	304
Local	411	Granada Highlands - Malden Ctr. Sta.		135%	52%	Fail	100.0%	389
Express	424**	Eastern/Essex Sts. - Haymarket Sta.		70%	50%	Fail	100.0%	95
Express	426**	Lynn Central Sq. - Haymarket via Saugus		135%	56%	Fail	100.0%	714
Express	428	Oaklandvale - Haymarket via Granada Hglds.		102%	64%	Fail	100.0%	63
Local	429	Northgate Shopping Ctr. - Lynn Central Sq.		111%	51%	Fail	99.8%	451
Local	430	Saugus, Appleton St. - Malden Ctr. Sta.	Fail	160%	59%	Fail	100.0%	441
Local	431	Neptune Towers - Lynn Central Sq.		50%	50%	Fail	97.4%	184
Express	434	Peabody Sq. - Haymarket Sta.		68%	60%	Fail		**
Local	435	Liberty Tree Mall - Lynn Central Sq.		90%	50%	Fail	100.0%	357
Local	436	Liberty Tree Mall - Lynn Central Sq.		109%	60%	Fail	100.0%	347
Local	439	Nahant - Lynn Central Sq.		13%	69%	Fail	100.0%	188
Express	441**	Marblehead - Haymarket via Paradise		120%	51%	Fail	99.9%	409
Express	442**	Marblehead - Haymarket via Humphrey		140%	55%	Fail	99.7%	749
Express	448	Marblehead - Dwtm. Crossing via Paradise		93%	51%	Fail	100.0%	53
Express	449	Marblehead - Dwtm. Crossing via Humphrey		98%	61%	Fail	100.0%	63
Express	450**	Salem Depot - Haymarket via Western Ave.		110%	45%	Fail	100.0%	629
Local	451	North Beverly - Salem Depot		47%	46%	Fail	98.9%	268
Express	455**	Salem - Haymarket via Lynn Cent. Sq.		93%	42%	Fail	99.6%	459
Local	456	Salem Depot - Lynn Central Sq.		43%	68%	Fail	100.0%	147
Express	459	Salem Depot - Downtown Crossing		98%	34%	Fail	100.0%	284
Local	465	Liberty Tree Mall - Salem Depot		40%	49%	Fail	99.8%	218
Local	468	Danvers Sq. - Salem Depot		10%	70%	Fail		***

*Unofficial assessment

**Routes 424, 426, 441, 442, 450, and 455 each have a variation that ends at Wonderland Station.

***Routes 434 and 468 operate only one or two inbound trips in the AM and one or two outbound trips in the PM daily.

Blue Line rapid transit service from June through October met the MBTA's schedule adherence standard of 95% on-time performance, according to the November 2010 ScoreCard. In addition, the average daily vehicle availability was well above the required level of 72 cars, and the mean miles between failures exceeded the target level of 26,000 for the same time period.

The ScoreCard shows that neither the Newburyport nor the Rockport commuter rail line passed the schedule adherence standard, which requires that 95% of all trips departing and arriving at terminals be within five minutes of the scheduled departure and arrival times. For locomotives, the average daily vehicle availability meets the minimum requirement to operate the scheduled service, and the mean miles between failures is well below acceptable levels (4,705 vs. the goal of 10,200). The MBTA is currently in the process of procuring 75 new bi-level commuter rail coaches and 22 locomotives. This should improve capacity and reliability in the Northeast Corridor and systemwide.



Mobility Issues Identified in the Program for Mass Transportation (PMT)

In addition, the MBTA's PMT approved in December 2009 identified the following specific transit capacity needs and other issues regarding mobility in the Northeast Corridor:

- By 2030, large growth in intracity trips is projected for Peabody, Beverly, and Salem, all of which currently have only partial local transit coverage.
- By 2030, modeling projections suggest that three bus routes in the Northeast Corridor (Routes 110, 111, and 117) will experience passenger crowding levels that would trigger the need for additional service or larger, articulated vehicles.
- Lynn had the highest number of total intracity trips in this corridor in 2000 (138,747). Although the rate of growth in trips is projected to be relatively small, Lynn is projected to continue to have the most trips within any single municipality in the corridor in 2030. Lynn's transit mode share is, however, comparatively low, despite a robust bus and commuter rail network.
- Very densely populated areas in Chelsea that currently generate significant numbers of trips into the urban core do not have frequent rapid transit service within a reasonable walking distance.
- Very densely populated areas in Lynn that currently generate significant numbers of trips into the urban core do not have frequent rapid transit service within a reasonable walking distance.

- Capacity constraints, primarily due to sections of single track, exist on the trunk portion as well as both branches of the Newburyport/Rockport commuter rail line. Double-tracking these areas would decrease the potential for delays and would allow for additional service in the future.

Transit Station Parking Issues

- The current park-and-ride inventory shows that the following stations are utilized at 85% of capacity or greater:
 - Ipswich (Newburyport Line)
 - Manchester (Rockport Line)
 - Wonderland (Blue Line)
- For some customers, access to rail services is constrained by the lack of bicycle parking.



Connections with Other Regional Transit Authorities' Services

Both the Merrimack Valley Regional Transit Authority (MVRTA) and the Cape Ann Transportation Authority (CATA) serve the Northeast Corridor; however, current schedules provide few close connections between RTA and MBTA services. In general, RTA bus routes do not function well as commuter rail feeders, as they serve different purposes and populations. Most RTA routes provide local service on even headways, while commuter rail provides long-distance commuter service and operates on uneven headways due to a number of equipment and operational constraints. In addition, because

RTA routes have frequent stops and many do not provide direct service to stations, using them to access stations is much slower than driving.

Freight Mobility Issues

Highway Freight Bottlenecks

Route 1 at Route 60 (Mahoney/Bell Circle) was identified in the MassDOT Freight Plan as one of the 12 worst highway freight bottlenecks in Massachusetts.

Vertical Clearance of Railroad Bridges

The desired vertical clearance for bridges over rail lines is 20 feet 8 inches. This allows double-stack trains to operate on the tracks. Of the 54 bridges over rail lines in the corridor, 45 (83%) do not meet this desired height.

"Last Mile" Connections

Massachusetts's seaports, like most other older seaports, have difficulty moving freight

between their facility and major highways and rail lines. Interposed are districts of local or residential streets. Neither the Port of Salem nor the Port of Gloucester has direct connections to major highways or rail lines. The closest rail lines are about one mile from both ports.

Air Freight Land Use and Access

Preserving sites and developable space for air cargo warehousing and freight-forwarding facilities in South Boston and along Route 1 and 1A is a top priority for the air cargo industry. Landside congestion is a threat to restrict air freight activity at Logan International Airport.

Bicycle and Pedestrian Mobility Issues

According to the Regional Bicycle Plan, 66% of all trips in the region are under five miles. Thus, there is potential to increase the percentage of short trips by bicycle. However, in order for more trips by bicycle to occur, users need safe routes. According to the Regional Bicycle Plan, 76% of respondents to MAPC's bicycle survey rated the bicycling conditions in their community as "fair" or "poor" and 45% indicated that they would bicycle more often if provided with a safer route as their top response.

Currently, gaps in the Northeast Corridor's bicycle network limit users' ability to safely connect to their destinations. Unlike the Northwest and West corridors, the Northeast Corridor lacks a bicycle corridor to Boston, and east-west connectors are limited. In particular, Boston Harbor poses a unique challenge to bicycle access into Boston. The close proximity of the Independence Greenway Trail (Peabody), Salem Bike Path, and Marblehead Rail Trail (Marblehead, Salem) provides opportunities to improve bicycle connectivity by linking existing paths. None of the bicycle facilities identified in the North Shore Corridor of MassDOT's Bay State Greenway Plan has been constructed within the Northeast Corridor. However, the low coverage of the current bicycle network limits users' ability to access activity generators, including transit stations, schools, recreation destinations, and commercial areas.

Although providing bicycle parking at stations and racks on buses encourages riders to access transit services by bicycle, poor access to stations can limit their utilization. Currently, there are few on-road or off-road bicycle accommodations for accessing the Blue Line of the rapid transit system or the Newburyport or Rockport Line of the commuter rail system. On the Blue Line, the East Boston Greenway provides bicycle access to Maverick Station and Airport Station. On the Rockport Line, the Salem Bike Path provides bicycle access to the Salem Station.

The Northeast Corridor's pedestrian network is more developed than the bicycle network, but it varies significantly. Sidewalk coverage in the corridor ranges from a low of 15% coverage in Ipswich to a high of 87% coverage in Winthrop. Gaps in the pedestrian network limit users' access to activity generators, including transit stations, schools, recreation destinations, elderly services, and commercial areas. Pedestrian access to both rapid transit and commuter rail stations varies significantly, from poor access at Wonderland Station in Revere and West Gloucester Station in

Gloucester to good access at Beverly Farms Station in Beverly and Maverick Station in East Boston. Some of the issues limiting pedestrian access at stations are associated with crosswalks, sidewalks, and station signage.

Safety Issues

MassDOT identifies “crash clusters” based on crash reports provided by its Registry of Motor Vehicles. The clusters are ranked based on the sum of the Equivalent Property Damage Only (EPDO) values of the crashes within the clusters. EPDO values are calculated by giving a crash a 10 if it involves a fatality, a 5 if a personal injury is involved, and a 1 if the crash results in property damage only. MassDOT applies a spatial algorithm to generate the clusters. EPDO values are used by the MPO in selecting locations for safety-based studies and in the LRTP and TIP project selection process.



Figure 2-16 identifies the top crash cluster locations in the Northeast Corridor. It shows that the locations in this corridor with the highest EPDO values are located on Routes 1, 114, 128, and 129. Specifically, the locations with the highest EPDO values (shown in parentheses below) are:

- Route 1 at Route 129, Saugus (449)
- Route 128 at Route 114, Peabody (404)
- Route 1 at Essex Street, Saugus (289)
- Route 114 at Route 1, Danvers (283)
- Route 128 at Endicott Street, Danvers (261)

Environmental Issues

Figures 2-17 through 2-19 provide an overview of environmental constraints in the Northeast Corridor. They include:

- Department of Environmental Protection–designated wetlands
- FEMA flood zones
- Public water supplies
- Surface Water Protection Areas
- Natural Heritage and Endangered Species Program Priority Habitats
- Protected open space

The Northeast Corridor has three Areas of Critical Environmental Concern (ACEC):

FIGURE 2-16

TOP FIVE PERCENT OF CRASH CLUSTER LOCATIONS – NORTHEAST CORRIDOR

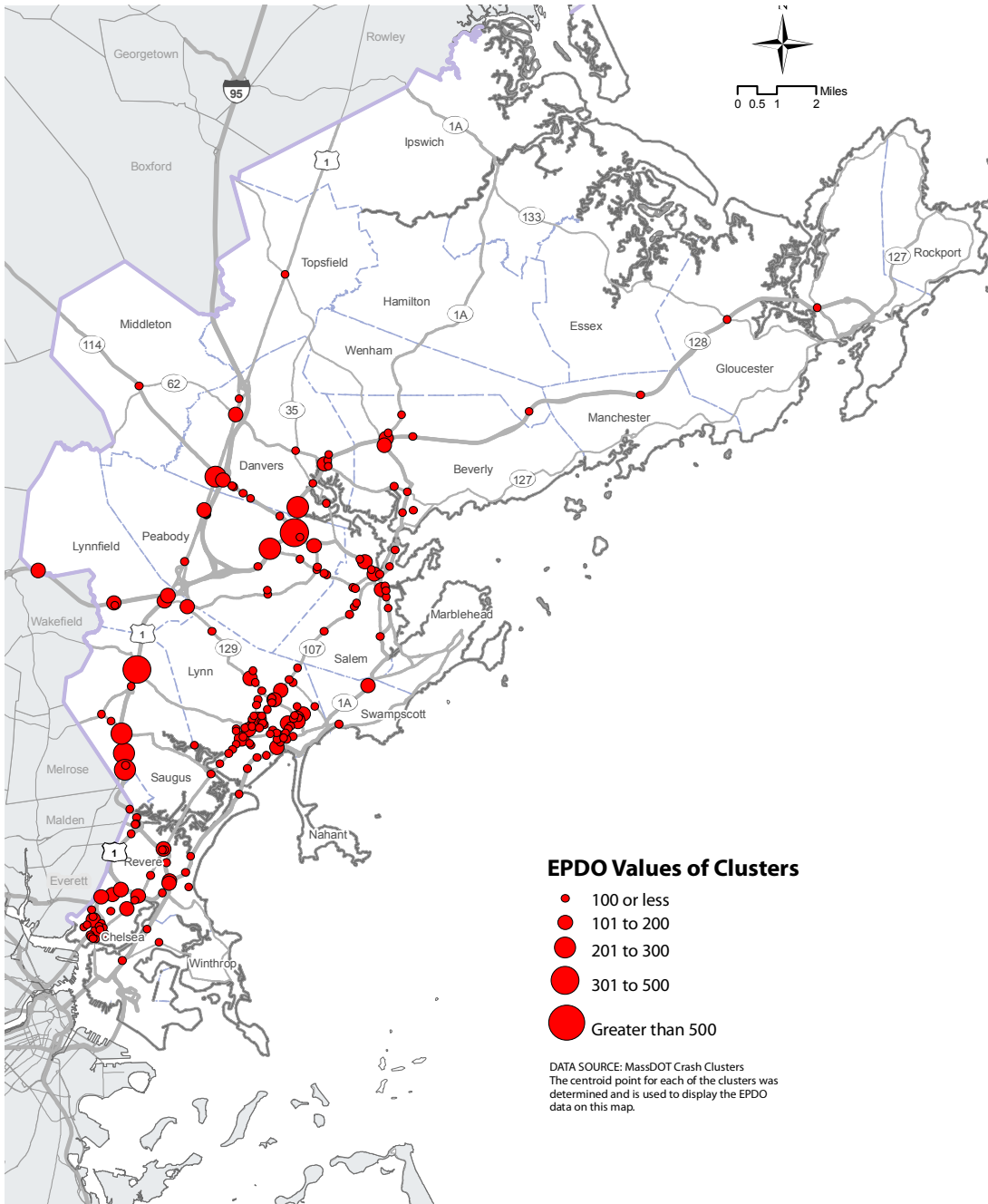
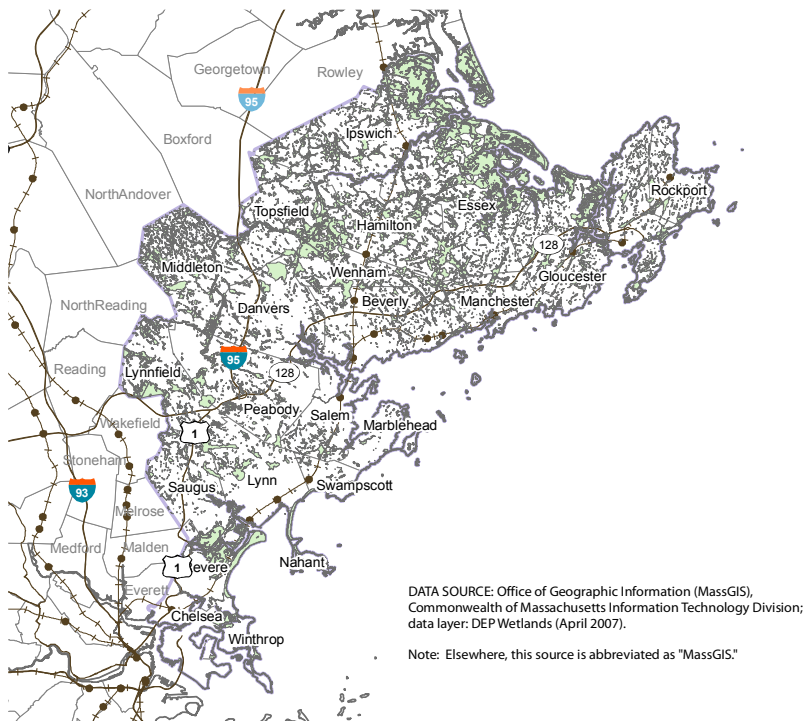


FIGURE 2-17

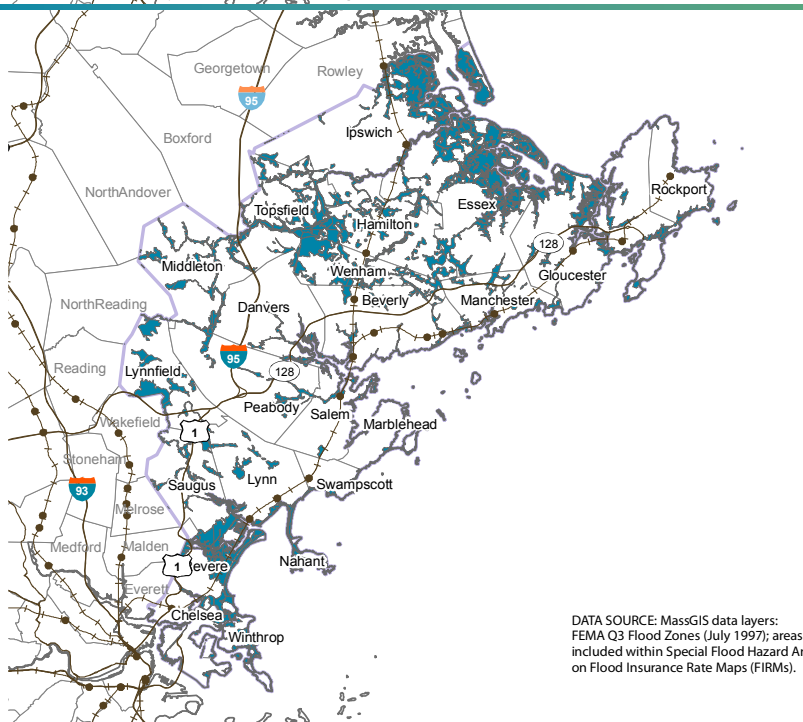
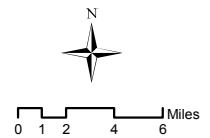
DEP WETLANDS/FEMA FLOOD ZONES – NORTHEAST CORRIDOR



DEP Wetlands

All categories

Massachusetts Department of Environmental Protection (DEP), Wetlands Conservancy Program



FEMA Q3 Flood Zones

Special Flood Hazard Area

Special Flood Hazard Areas (SFHAs) are areas subject to inundation by a flood having a 1% or greater probability of being equaled or exceeded during any given year. This flood, which is referred to as the 1% annual chance flood (or base flood), is the national standard on which the floodplain management and insurance requirements of the National Flood Insurance Program are based.

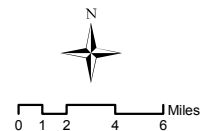
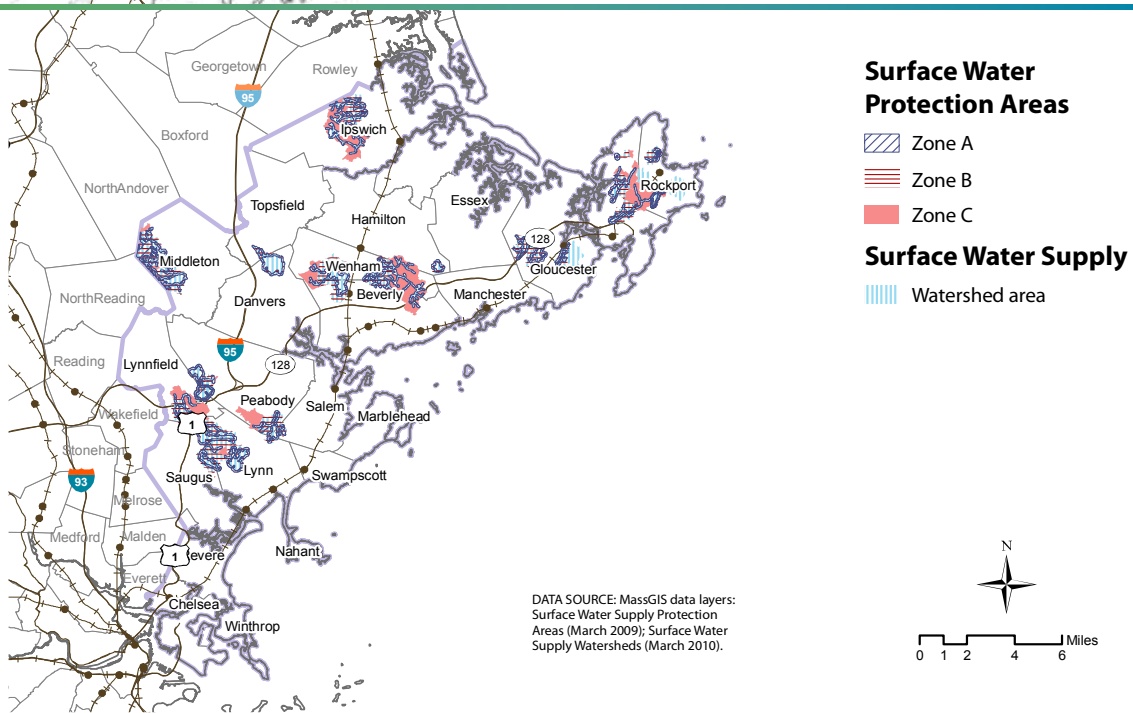
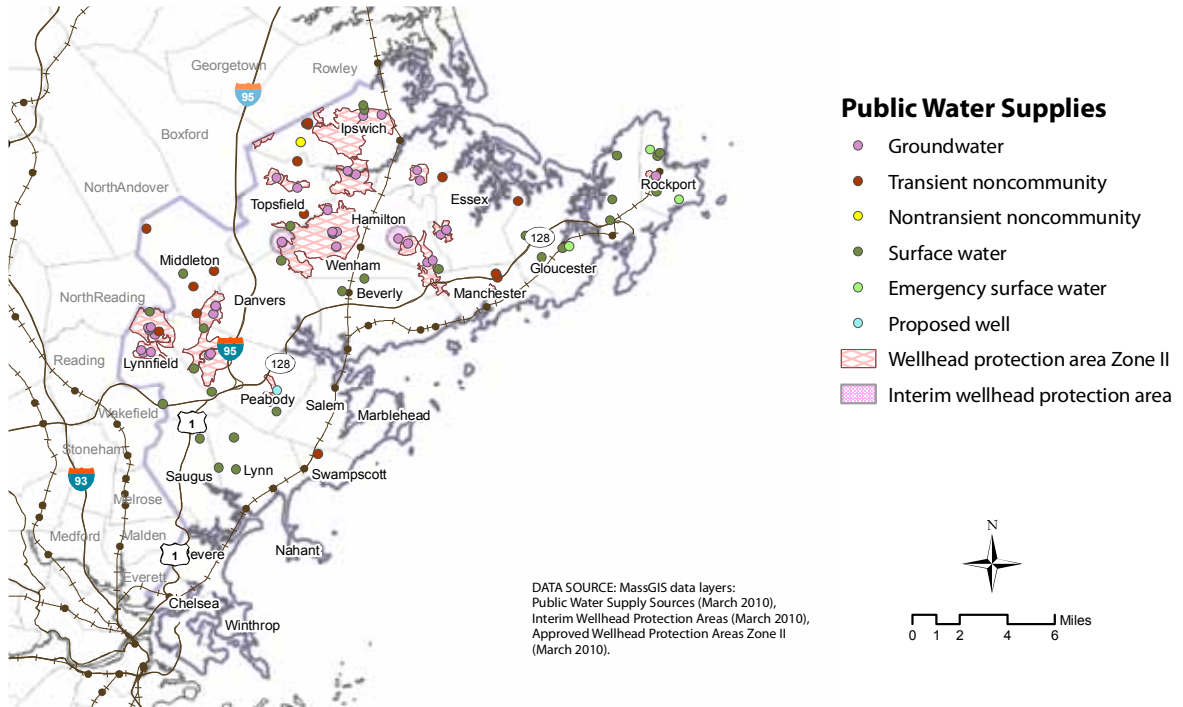


FIGURE 2-18

PUBLIC WATER SUPPLY/SURFACE WATER PROTECTION AREAS – NORTHEAST CORRIDOR



- Rumney Marshes, located in Boston, Lynn, Revere, Saugus, and Winthrop. Rumney Marshes has 2,800 acres and was designated in 1988.
- Great Marsh, located in Essex, Gloucester, Ipswich, Newbury, and Rowley. Great Marsh has 25,500 acres and was designated in 1979.
- Golden Hills, located in both the Northeast and North corridors in Melrose, Saugus, and Wakefield. Golden Hills has 500 acres and was designated in 1987.

The locations of projects being considered for inclusion in the LRTP are overlaid on these environmental constraint maps. This information is then used during the project selection process. These environmental constraints are further addressed during project design and mitigation.

Transportation Equity Issues

The MPO’s transportation equity program considers the needs of persons in environmental justice areas. The MPO defines these areas as those that have both a population that is over 50% minority and a median household income at or below 60% of the region’s median income (at or below \$33,480). The environmental justice areas located in the Boston Region MPO portion of the Northeast Corridor include areas in Chelsea, East Boston, Lynn, Peabody, Revere, and Salem. MPO staff meet with social service and community contacts and conduct surveys to identify needs within these environmental justice areas. Table 2-19 outlines issues and needs and suggested responses identified by contacts in the environmental justice areas in the Northeast Corridor.



TABLE 2-19

IDENTIFIED TRANSPORTATION EQUITY ISSUES

COMMUNITY	REPORTED ISSUES	POSSIBLE SOLUTIONS*
East Boston	Many transit trips require too many transfers.	Connect the Blue Line to the Red Line at Charles/MGH Station. Project design & DEIR began in fall 2008
		Extend the Blue Line to Lynn. Project currently moving forward in DEIS to be filed by MassDOT.
East Boston	East Boston experiences a lot of traffic congestion and air pollution from airport-generated traffic.	Construct a truck route on the railroad bed under Bennington Street.
		Improve the intersection of Bennington Road and Saratoga Street.
		Construct a grade-separated interchange for traffic traveling between Route 1A and Boardman Street.
East Boston	Chelsea Street Bridge replacement is needed but will be a burden to the community during construction.	
Lynn	Lack of public transportation to employment opportunities limits the ability of people to work..	Better transit coverage to destinations north and west of Lynn.
		Transit access to employment opportunities around 128, along Route 1, and in other North Shore communities.
		Transportation for day-labor jobs.
Lynn	Commuting to Boston is time-consuming and expensive (commuter rail is infrequent and use of the Blue line usually requires two transfers).	Extension of the Blue Line to Lynn.
		Increased off-peak frequency on commuter rail.
Lynn	Some of the low-income residents cannot afford transit fares.	Discount tickets for clients of social service agencies who are too poor to afford transit fares for necessary trips.
Lynn	Transit-dependent Lynn residents have no ability to travel west and limited ability to travel north.	Better transit coverage to destinations north and west of Lynn.
Lynn	Residents need reliable, low-cost transportation to link them with Boston, Cambridge, Lowell, Methuen, Andover, Danvers, the North Shore, and other areas of economic growth.	Transit service to employment opportunities in the North Shore, Lowell, Methuen, Andover, Danvers, and Cambridge.
		Fare reductions for poorest residents.
Lynn	Commuter rail service is infrequent (especially during the off-peak), and the station is dark, dirty, and in poor condition.	Improve condition of and maintain commuter rail station.
		Extension of the Blue Line to Lynn.
Lynn	Lack of regional bus service between Lynn and the Danvers campus of North Shore Community College, between the three North Shore Community College campuses (Beverly, Danvers, and Lynn), and to UMass Lowell limits the ability of students to attend.	Regional bus service, to include service between Lynn and the Danvers campus of North Shore Community College as well as between the North Shore Community College campuses (Beverly, Danvers, and Lynn) and to UMass Lowell.
Lynn	There are congestion and safety issues on Route 129 East at the exit from Route 1 North (Goodwin Circle).	Study alternatives to improve traffic flow. (MPO studied other parts of Route 129 (Lynnfield Square) and Route 1 in Mid-North Shore Regional Transportation study.)
Lynn	Public transportation has limited ability to meet the needs of elderly and people with disabilities who have limited mobility.	Affordable (for the poor) transit service which can accommodate the needs of the elderly and people with disabilities (paratransit).
		Shuttle service to Market Basket and Wal-Mart in Danvers.
		Need to improve the reliability and availability of THE RIDE.

(CONT.)

TABLE 2-19 (CONT.)

IDENTIFIED TRANSPORTATION EQUITY ISSUES

COMMUNITY	REPORTED ISSUES	POSSIBLE SOLUTIONS*
Lynn	Transit-dependent residents have difficulty making shopping, errand, and social trips.	Intra-city bus service (similar to the old East-West Loop).
Lynn	Regional traffic flow from Federal Street is a burden around the Common.	Study traffic flow around the Common in general and the traffic flow from Federal Street to South Common Street to Commercial Street, particularly at the intersection of South Common and Commercial.
Lynn	THE RIDE service is not appropriate for all trips.	Transportation service for sick visits to physicians and return trips from cancer treatments, hospitalization, and other health services where the patient needs direct transport home.
Lynn	Existing transit services, including THE RIDE, do not meet all the transportation needs of elderly and people with disabilities who are transit dependent.	Service to accommodate the needs of elderly and disabled who can not use public transportation (e.g., the bus stop is too far) and are not eligible for THE RIDE.
		Accessible buses.
		Accessible, user-friendly, smaller vehicles for elderly.
		Improved reliability of THE RIDE.
		Funding for Councils on Aging to purchase or contract for transportation services.
		Accessible transportation for trips to stores, malls, and entertainment centers.
Lynn	Transit service is focused on trips to Boston; traveling elsewhere requires travel first into Boston and then out to the destination and often requires several transfers.	Shelters and benches at bus stops.
		More direct service to other communities, including Peabody and Chelsea.
Lynn	Transit fares are a burden for low-income residents.	Reduced transit fares for the very low-income.
Lynn	Existing transit services do not meet the needs of all health care-related trips.	Evening service to/from Union Hospital for patients, visitors, and employees.
		Taxi vouchers for people who are temporarily disabled or have tremendous difficulty using public transportation due to economic or physical condition and do not qualify for PT-1 transportation.
		Transportation service for sick visits to physicians and return trips from cancer treatments, hospitalization, and other health services where the patient needs direct transport home.
		Van service to and from sites where it is difficult for patients to travel (e.g., Boston hospitals, Lahey Clinic, Lowell Association for the Blind, physician's offices, and Danvers Women's Health).
Peabody	Peabody has little transit service (only limited bus service) and this is a burden for low-income households.	Passenger service (light rail line) on the spur from Peabody Square to Salem Depot.
		Direct transit service to Boston, Cape Ann, the North Shore, Centennial Park, Lahey Clinic, North Shore Mall, downtown Peabody, medical offices, and supermarkets.
Peabody	Peabody suffers from congestion due to limited public transport options and regional cut-through traffic, including a disproportionate amount of truck traffic. This creates safety concerns and stifles pedestrian activity downtown, where the highest concentration of the environmental justice population lives.	Traffic calming downtown, on Main Street, around Peabody Square. (Project currently under development)

* These ideas are proposed by transportation equity contacts responding to MPO outreach. Not all solutions have been studied and some may not be feasible.

SUMMARY OF NORTHEAST CORRIDOR NEEDS

The preceding sections have laid out the corridor's existing transportation infrastructure, land use conditions, travel characteristics and patterns, and transportation-related needs. This section summarizes the corridor's needs that are the most pressing as assessed in light of the MPO's visions established for *Paths to a Sustainable Region* and the available information on needs. Many needs identified in the preceding sections stand out. In addition to passenger transportation needs by mode, this summary includes issues related to freight transportation, land use, and transportation equity.

Paths to a Sustainable Region envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between nonmotorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.



Highway

Paths to a Sustainable Region envisions a highway system that is well maintained and has less congestion and fewer severe crashes. The Northeast Corridor needs assessment identifies bridge and roadway maintenance needs and significant bottleneck and crash locations. Addressing the identified needs and problems listed below will promote the realization of the vision:

- Of the 293 bridges in the Northeast Corridor, 62 (21%) are considered functionally obsolete (do not meet current traffic demands or highway standards), and 25 (8.5%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).
- Highway bottlenecks cause congestion and accidents and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway mobility section of this chapter:
 - Route 1A from Boston to Danvers
 - Route 1 from Chelsea to Danvers
 - Route 62 in Danvers and Beverly

- Route 107 in Revere, Lynn, and Salem
- Route 114 from Danvers to Marblehead
- Route 129 in Marblehead, Swampscott, and Lynn
- The top crash locations in the Northeast Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in descending order of severity, are:
 - Route 1 at Route 129, Saugus (EPDO value: 449)
 - Route 128 at Route 114, Peabody (404)
 - Route 1 at Essex Street, Saugus (289)
 - Route 114 at Route 1, Danvers (283)
 - Route 128 at Endicott Street, Danvers (261)

Transit

Paths to a Sustainable Region envisions a transit system that, like the envisioned highway system, is safe and maintained in a state of good repair. However, unlike the vision for the highway system, the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- On the Blue Line, power substation equipment, an outdated signal system, and some parts of the overhead catenary and track and switches are in need of replacement.
- On the Newburyport/Rockport Line, one drawbridge needs upgraded electrical controls. Sections of single track on the trunk and branch lines constrain capacity and cause delay.
- The Lynn bus garage needs several improvements.
- Transit reliability is poor. Only two (bus Routes 111 and 121) of the 31 bus routes (6%) and neither of the commuter rail lines, meet the MBTA's schedule adherence standards.
- Three bus routes in the Northeast Corridor (Routes 110, 111, and 117) are predicted to experience passenger crowding levels that



would necessitate additional service or larger, articulated vehicles.

- Two commuter rail stations are not ADA accessible (Prides Crossing and Chelsea).
- The Ipswich and Manchester commuter rail park-and-ride lots and the Wonderland park-and-ride lot on the Blue Line are utilized at 85% of their capacity or greater.

Issues to watch:

- Very densely populated parts of Chelsea and Lynn lack rapid transit service.
- By 2030, large growth in intracity trips is projected for Peabody, Beverly, and Salem, all of which currently have only partial local transit coverage. Lynn has the highest number of intracity trips, but low transit mode share.
- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- Higher-density areas in parts of Beverly, Danvers, Marblehead, Revere, and Salem do not have direct access to transit service.

Freight

Paths to a Sustainable Region envisions a transportation system in which all freight modes operate efficiently by all modes. Addressing the needs and problems identified below will promote the realization of this vision:

- Route 1 at Route 60 (Mahoney/Bell Circle) was identified in the MassDOT Freight Plan as one of the 12 worst highway freight bottlenecks in Massachusetts.
- The entrance channel to the Port of Boston needs to be dredged to a depth of 50 feet, and the Conley Terminal access channel to 48 feet.
- Dredging is planned for the Port of Gloucester.
- Port areas lack direct connection to freight rail service and limited access highways.
- Preserving sites and developable space for air cargo warehousing and freight-forwarding facilities in South Boston and along Route 1 and 1A is a top priority for the air cargo industry. Landside congestion is a threat to restrict air freight activity at Logan International Airport.

Issues to watch:

- If demand for rail freight increases, tracks carrying that freight in the Northeast Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds per train car. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.
- The desired vertical clearance is not met by 79% of highway bridges nor by 83% of railroad bridges.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of this vision:

- There are few on-road or off-road bicycle facilities connecting to Blue Line or commuter rail stations.
- Few roads (approximately 2%) in the Northeast Corridor provide bicycle accommodations.
- About 48% of the non-interstate roads in the Northeast Corridor do not have a sidewalk on either side of the roadway.
- The Northeast Corridor lacks a bicycle corridor into Boston Proper. There are limited major bicycle connections for east-west travel.
- Some transit stations have poor pedestrian access.



Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group. Addressing the needs and problems identified below will promote the realization of this vision:

- Lynn residents lack rapid transit service into Boston Proper, and residents of East Boston and Revere do not have easy access to the Red Line due to the lack of a connection between it and the Blue Line.
- The airport generates traffic congestion in East Boston.
- Transit service is focused on travel to and from Boston and is inadequate for travel within the corridor.

Issue to watch:

- The transportation system will need to address the needs of the elderly population, which is expected to grow substantially during the time horizon of *Paths to a Sustainable Region*.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas already well served by infrastructure. As the work toward realization of this vision proceeds, issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the Blue Line and commuter rail lines. Transit capacity may need to increase in order to handle service demands.
- Two major mixed-use developments are planned for the corridor: the redevelopment of the Lynn waterfront (3,500 housing units and 2 million square feet of retail, office, and hotel space expected) and the transit-oriented development around Wonderland Station in Revere (750 housing units, 175,000 square feet of commercial and retail space, and a hotel expected).