



DESCRIPTION OF THE CORRIDOR

The Southeast Corridor extends from Boston to the towns of Middleborough and Plymouth. The corridor is anchored in the north by the Boston neighborhoods of South Boston, Dorchester, and Mattapan, and the densely populated city of Quincy, and extends to the south through a very diverse assortment of suburban communities. Seventeen 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 southeast) Milton, Randolph, Braintree, Holbrook, Weymouth, Hingham, Hull, Cohasset, Rockland, Norwell, Scituate, Hanover, Marshfield, Pembroke, and Duxbury.

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.

Thirteen corridor municipalities, all located in the southern part of this corridor, are outside of the Boston Region MPO area: Avon, Brockton, West Bridgewater, Abington, Whitman, East Bridgewater, Hanson, Bridgewater, Halifax, Plympton, Kingston, and Plymouth, which are in the Old Colony MPO area, and Middleborough, which is in the Southeast Regional Planning and Economic Development District MPO area.

EXISTING TRANSPORTATION FACILITIES

The major transportation facilities and services in the Southeast 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 Southeast Corridor are included in this section for informational purposes.

Highway

The major roadways in this corridor are (see Figure 7-1):

- North–south travel: Interstate 93 (the section between Boston and Braintree is also known as the Southeast Expressway and includes a reversible high-occupancy vehicle lane), Route 3, Route 3A, Route 28, Route 37, Route 53, Route 58, Route 228, Route 18, and Route 24
- East–west travel: Route 139, Route 123, Route 106, Route 14, and Route 27

There are 1,829 centerline miles in the corridor:

- State-owned – 154 centerline miles (8%)
- Locally owned – 1,466 centerline miles (80%)
- Privately owned – 209 centerline miles (12%)

When looking at lane miles (as opposed to centerline miles) in the corridor, there are a total of 2,635 lane miles. Of the total lane miles, 36% or 955 lane miles are federal aid eligible.

There are 375 bridges in the corridor:



- State-owned – 325 (87%)
- Locally owned – 46 (12%)
- Other – 4 (1%)

Of the 375 bridges, 149 (39%) accommodate pedestrians as well as motorists, 28 (7%) are for bicyclists and pedestrians only, 63 (17%) are railroad bridges over highways or water, and 1 (less than one percent) is closed.

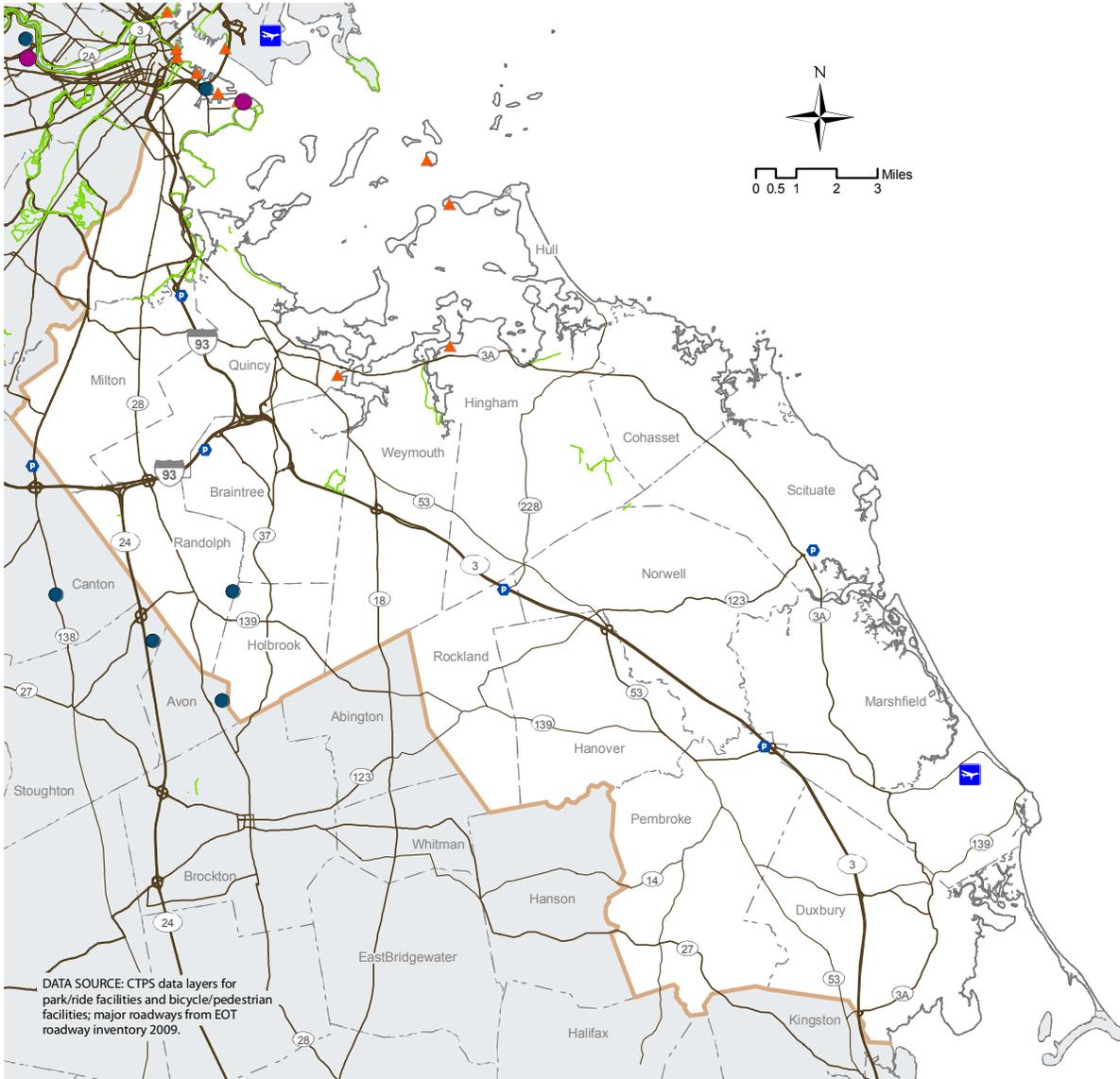
Park-and-ride facilities that are not connected with a public transit station are located in Rockland, Pembroke, and Milton (inside of the Boston Region MPO) and Kingston, Plymouth, West Bridgewater, and Bridgewater (outside of the Boston Region MPO area). They are operated by MassDOT.

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's THE RIDE program and the Brockton Area and the Greater Attleboro-Taunton Regional Transit Authorities; see Figure 7-2. A description of the transit services is provided below.

FIGURE 7-1

EXISTING HIGHWAY TRANSPORTATION FACILITIES - SOUTHEAST



DATA SOURCE: CTPS data layers for park/ride facilities and bicycle/pedestrian facilities; major roadways from EOT roadway inventory 2009.

- | | |
|-------------------------------|---|
| — Major highways | IntermodalTruckTripGenerator2009 |
| Ⓟ Carpool-bus park/ride lots | ● Internal Intermodal Transfer Point |
| ▲ Port facilities/docks | ● Distribution Center |
| ✈ Airports | ● External Intermodal Transfer Point |
| — Dedicated bicycle: existing | |

Commuter Rail and Intercity Rail

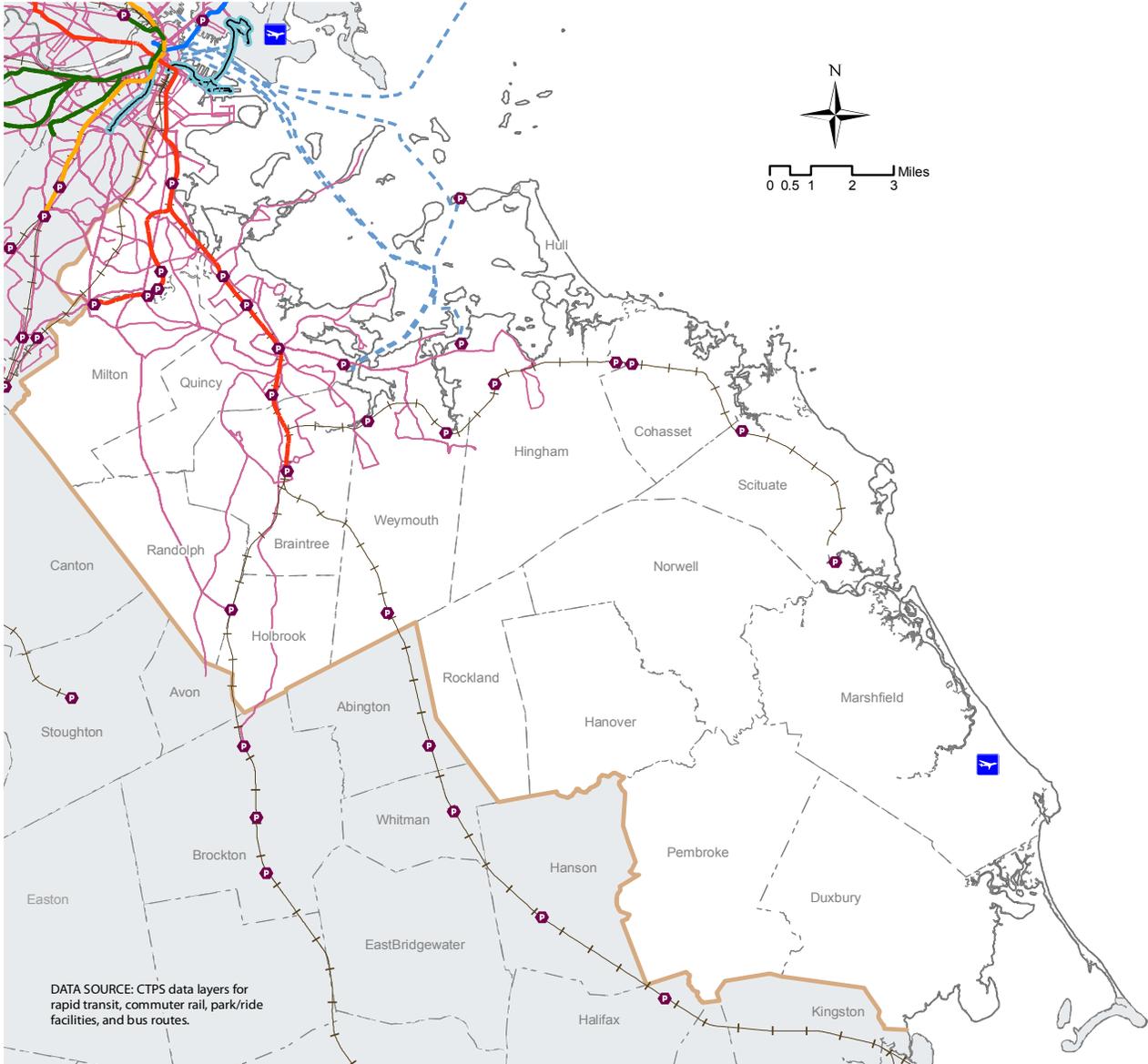
Four MBTA commuter rail lines run through the corridor and provide service into South Station in Boston. Three of the lines, the Greenbush, Kingston/Plymouth, and Middleborough/Lakeville Lines, are also referred to as the Old Colony Lines. The stations on the line, along with their numbers of park-and-ride spaces and average utilization rates, and other selected information as applicable, are:

- Fairmount Line, with four stations:
 - Uphams Corner – No parking; bus connections
 - Morton Street – No parking; bus connections
 - Fairmount – 50 spaces¹ (13% utilization rate); bus connections
 - Readville – 347 spaces (shared with station on the Franklin Line, 26% utilization rate)¹;
- Greenbush Line, with seven stations:
 - Weymouth Landing/East Braintree – 290 park-and-ride spaces (62% utilization rate); bus connections
 - East Weymouth – 335 park-and-ride spaces (51% utilization rate); bus connections
 - West Hingham – 214 park-and-ride spaces (38% utilization rate); bicycle parking also
 - Nantasket Junction (Hull) – 495 park-and-ride spaces (14% utilization rate)
 - Cohasset – 410 park-and-ride spaces (24% utilization rate)
 - North Scituate – 253 park-and-ride spaces (40% utilization rate)
 - Greenbush – 1,000 park-and-ride spaces (18% utilization rate)
- Kingston/Plymouth Line, with seven stations:
 - South Weymouth – 543 park-and-ride spaces (38% utilization rate); bicycle parking also
 - Abington – 405 park-and-ride spaces (41% utilization rate); bicycle parking also
 - Whitman – 108 park-and-ride spaces (48% utilization rate); bicycle parking also
 - Hanson – 482 park-and-ride spaces (36% utilization rate); bicycle parking also
 - Halifax – 402 park-and-ride spaces (37% utilization rate); bicycle parking also
 - Kingston – 1,039 park-and-ride spaces (23% utilization rate); Greater Attleborough-Taunton Regional Transit Authority (GATRA) bus connections

¹ This station is located in the Southwest corridor. It is included here for informational purposes only.

FIGURE 7-2

EXISTING TRANSIT TRANSPORTATION FACILITIES - SOUTHEAST



- Blue Line
- Green Line
- Orange Line
- Red Line
- Silver Line
- MBTA Commuter Rail
- MBTA bus routes
- - - Commuter boats
- P Transit-boat park/ride lots
- ✈ Airports

- Plymouth – 96 park-and-ride spaces (1% utilization rate); bicycle parking also; GATRA bus connections
- Middleborough/Lakeville Line, with six stations:
 - Randolph/Holbrook – 369 park-and-ride spaces (38% utilization rate); bicycle parking also; bus connections
 - Montello (Brockton) – 347 park-and-ride spaces (28% utilization rate); bicycle parking also; Brockton Area Transit Authority (BAT) bus connections
 - Brockton – 266 park-and-ride spaces (53% utilization rate); bicycle parking also; BAT bus connections
 - Campello (Brockton) – 535 park-and-ride spaces (20% utilization rate); bicycle parking also; BAT bus connections
 - Bridgewater – 504 park-and-ride spaces (35% utilization rate); bicycle parking also
 - Middleborough/Lakeville – 769 park-and-ride spaces (46% utilization rate); bicycle parking also; GATRA bus
- The Greenbush, Kingston/Plymouth, and Middleborough/Lakeville Lines converge into the Old Colony mainline in Braintree. There are three stations on the mainline:



- JFK/UMass – no parking; rapid transit station; bus connections
- Quincy Center – 872 park-and-ride spaces (45% utilization rate); rapid transit station; bicycle parking also; major bus hub
- Braintree – 1,322 park-and-ride spaces (100% utilization rate); bicycle parking also; rapid transit station; bus connections

MBTA Rail Rapid Transit

The MBTA rapid transit services included in this corridor are the Braintree and Ashmont branches of the Red Line, as well as the Mattapan High Speed Line. These stations, along with their numbers of park-and-ride spaces and other selected information as applicable, are:

- Ashmont Branch with four stations:
 - Savin Hill – 30 park-and-ride spaces (100% utilization rate); bus
 - Fields Corner – No parking; bus hub

- Shawmut – No parking
- Ashmont – No parking; bicycle parking; major bus hub; connects with the Mattapan High Speed Line; connections to Brockton Area Transit (BAT)
- Braintree Branch with five stations:
 - North Quincy – 1,206 park-and-ride spaces (63% utilization rate); bicycle parking also; bus connections
 - Wollaston – 550 park-and-ride spaces (98% utilization rate); bicycle parking also; bus connections
 - Quincy Center – 872 park-and-ride spaces (45% utilization rate); bicycle parking also; commuter rail; major bus hub
 - Quincy Adams – 2,538 park-and-ride spaces (69% utilization rate); bicycle parking also; bus connections
 - Braintree – 1,322 park-and-ride spaces (100% utilization rate); bicycle parking also; commuter rail; bus connections
- Mattapan High Speed Line, which feeds into Ashmont Station, with seven stops
 - Cedar Grove – No parking
 - Butler – 60 park-and-ride spaces (100% utilization rate)
 - Milton – 41 park-and-ride spaces (34% utilization rate); bicycle parking also; bus connections
 - Central Avenue – No parking; bus connections
 - Valley Road – No parking
 - Capen Street – No parking
 - Mattapan – 100 park-and-ride spaces (16% utilization rate); bicycle parking also; bus hub
- The Ashmont and Braintree branch lines converge at JFK/UMass Station in Boston. The three mainline stations in this corridor are:
 - Broadway – No parking; bus connections
 - Andrew – No parking; bus connections
 - JFK/UMass – No parking; bicycle parking; commuter rail; bus connections



Bus

Numerous public bus services operate in or through the corridor:

- MBTA bus rapid transit – Silver Line Waterfront – (trunk service and 2 routes) Trunk service runs every five minutes from South Station to Courthouse Station, World Trade Center Station, and Silver Line Way. From Silver Line Way, the SL1 provides service to all terminals at Logan Airport, and the SL2 provides service to the Design Center, making eight stops in South Boston. None of the SL1 or SL2 stops have parking; MBTA local bus routes serve two of the three trunk stations and three of the eight SL2 stops.
- MBTA express buses (3 routes) – These routes operate from Marblehead and Salem and stop in the South Boston Waterfront before terminating at Downtown Crossing in Boston Proper.
- MBTA local buses (32 routes) – Some of the local bus routes anchored at the Red Line stations offer circumferential connections to destinations in the Southwest Corridor. The MBTA also contracts with a private carrier to provide service through Milton and in Hingham and Hull.
- Logan Express provides service from Braintree to Logan Airport.



- Brockton Area Transit Authority (BAT) buses (18 routes) – BAT operates a network of bus routes, mostly within the City of Brockton, with one route operating to Ashmont station in Boston.
- Greater Attleborough-Taunton Regional Transit Authority (GATRA) – GATRA operates a network of five bus routes that serve Duxbury, Marshfield, Kingston and Plymouth. GATRA also operates a downtown Middleborough area shuttle.
- Municipal and private bus carriers – The Town of Dedham oversees a municipal transit service operated by a contractor. Plymouth & Brockton provides service between corridor communities, Boston, and Logan Airport.

Ferry

The MBTA operates five commuter boat routes between Boston and Logan Airport and terminals in Quincy, Hingham, and Hull. Ferry terminals along with their numbers of park-and-ride spaces and other selected information as applicable, are:

- Fore River Shipyard (Quincy) – 350 spaces (50% utilization rate); bus connections

- Hewitts Cove (Hingham) – 1,841 spaces (32% utilization rate); bicycle parking also; bus connections
- Pemberton Point (Hull) – 100 spaces managed by the town (no utilization data available); bicycle parking also; bus connections

Connections to MBTA Service from Other Regional Transit Authorities' Services

The two regional transit authorities (RTAs) that serve the corridor provide connections to MBTA services. Brockton Area Transit Authority (BAT) bus routes provide connections to three commuter rail stations on the Middleborough/Lakeville line: Brockton, Campello, and Montello. BAT also connects to the Red Line at Ashmont station. Greater Attleborough-Taunton Regional Transit Authority (GATRA) buses provide connections to the Kingston and Plymouth commuter rail stations on the Plymouth/Kingston Line. GATRA also operates a downtown Middleborough area shuttle which provides some trips to the Middleborough/Lakeville commuter rail station.

Transportation Management Associations

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

- The Medical Academic and Scientific Community Organization Inc. (MASCO) provides service between the JFK/UMass MBTA station and the Longwood Medical Area at no charge to employees and students of MASCO's member institutions.
- The Neponset Valley TMA offers one shuttle service - the Route 128 Station Link A is an employee shuttle service between the Ashmont and Quincy Center Red Line stations, the Reebok complex, the One Beacon complex, and the Computershare complex.



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 Southeast Corridor with the highest current volumes of truck traffic:

- Interstate 93 between the Neponset River and the South Boston Haul Road, with volumes ranging from 11,000 to approximately 19,500 trucks per day
- Interstate 93 from Route 24 to the Braintree Split (the intersection of Interstate 93 and Route 3), with volumes ranging from 9,000 to 13,000 trucks per day
- Interstate 93 from the Neponset River to the Braintree Split, with volumes ranging from 5,000 to 13,000 trucks per day
- Route 3 from the Braintree Split to Route 53, with volumes ranging from 5,000 to 9,000 trucks per day.
- Route 24 from I-93 to the Boston Region MPO border, with volumes ranging from 5,000 to 9,000 trucks per day.

Rail Freight

CSX Transportation operates secondary and industrial tracks in the corridor. CSX connects to the Fore River Railroad in South Braintree.

The Fore River Railroad runs on 2.7 miles of track between Quincy Point and the CSX yard in South Braintree. It ships bay state fertilizer for the Massachusetts Water Resources Authority (MWRA) and fatty acids for Twin Rivers Technology LLC. It utilizes the Fore River Yard in Quincy to serve Twin Rivers Technology and the MWRA.

Marine Freight

Conley Terminal in South Boston is a 101-acre multi berth terminal. It has 2,000 feet of berthing space at a depth of 45 feet. The terminal serves three of the world's 10 container lines and handles nearly 1.5 million metric tons of cargo annually. The top imports are alcoholic beverages, frozen seafood, footwear, and furniture. The top exports include hides and skins, automobiles, logs and lumber, frozen seafood, paper (including waste paper), and scrap metal. As of 2007, there was an average of 900

to 1,000 daily truck moves into and out of Conley Terminal handling approximately 220,000 twenty-foot equivalent (TEU) containers (TEU is a standard container measurement). There is no rail service directly to Conley Terminal. Massport has estimated that 75 to 90 percent of marine freight shipments into the Conley Container Terminal are destined for locations within 100 miles of the port.

The Massport Marine Terminal is an approximately 40-acre site located in the Boston Marine Industrial Park in South Boston. About 10 acres are dedicated to facilities that support the fishing industry.



The Terminal has a potential rail connection via the Boston Terminal Running Track, also known as Track 61. Drydock rail via track 61 to Boston Marine Industrial Park and the Massport North Jetty is seen as an opportunity and is being pursued. The Massachusetts Department of Transportation acquired track 61 from CSX on June 11, 2010.

The Port of Quincy is for the exclusive use of its owner, the MWRA. It is not a common user facility like Conley Terminal. A common-user facility is a publically-operated commercial port or terminal that may be used by multiple shipping lines or users upon payment of a tariff or user fee to the operator. Twin Rivers Technology and the MWRA are served from the Port by the Fore River Railroad.

The Boston Fish Pier, the International Cargo Port, and the Fargo Street Terminal are other maritime properties in South Boston.

Air Freight

There are no freight airport facilities in the corridor.

Intermodal Freight Facilities

The intermodal facilities located in the Boston Region MPO portion of the Southeast Corridor are shown in Figure 7-1 and listed below:

- Conley Terminal, South Boston
- Boston Freight Terminal, South Boston
- Kellaway Intermodal, Randolph

The intermodal facilities located in the Southeast Corridor but outside of the Boston Region MPO area are:

- Ocean Spray Processing Plant, Middleborough
- Christmas Tree Shops Distribution Center, Middleborough
- Reebok, Avon

Air

The Marshfield Municipal Airport – George Harlow Field is the only airport in the corridor that is within the Boston Region MPO area. Cranland Airport in Hanson and Plymouth Municipal Airport in Plymouth are in the corridor, but outside of the Boston Region MPO area.

Bicycle

Bicycle Paths

The corridor has one major bicycle path, the Neponset River Greenway, running approximately 2.5 miles in Boston and Milton.² It is shown in Figure 7-1, along

² The Neponset River Greenway is also part of the East Coast Greenway that aims to develop a trail system between Canada and Key West.



with other minor facilities used by bicyclists and pedestrians in the corridor. In addition, the Claire Saltonstall Bikeway, or State Bicycle Route 1, is a series of bicycle paths and on-street routes that travel from the Charles River Bike Paths in Boston to Provincetown in Cape Cod. Portions of the 165 mile route travel through the Central Area, Southwest Corridor, and Southeast Corridor. The Neponset River Greenway is an existing bicycle facility of the Boston-Cape Cod Corridor of MassDOT’s Bay State Greenway Plan. Currently, 49 of 150 miles of the proposed Boston-Cape Cod Corridor have been constructed.

On-Road Bicycle Accommodations

Table 7-1 shows the percentage of roadways in each of the Boston Region MPO municipalities in the Southeast Corridor that have on-road bicycle accommodations, defined as roadways with bicycle lanes or shoulders of four feet or greater. The Boston neighborhoods of South Boston, North Dorchester, and South Dorchester are not included in this table but are included in Chapter 8, Central Area. The Boston neighborhood of Mattapan is included in this table, and is not included in Chapter 8.

TABLE 7-1

PERCENTAGE OF ROADWAYS WITH BICYCLE ACCOMMODATIONS

MUNICIPALITY	TOTAL NON-INTERSTATE CENTERLINE MILES	CENTERLINE MILES WITH BICYCLE LANES	CENTERLINE MILES WITH FOUR-FOOT SHOULDERS	PERCENTAGE OF CENTERLINE MILES WITH BICYCLE ACCOMMODATIONS
Mattapan*	35	0.0	0.0	0.1%
Braintree	143	0.0	1.8	1.3%
Cohasset	48	0.0	2.6	5.3%
Duxbury	128	0.0	0.0	0.0%
Hanover	96	0.0	4.5	4.7%
Hingham	130	0.0	2.3	1.8%
Holbrook	47	0.0	2.7	5.7%
Hull	53	0.0	1.9	3.5%
Marshfield	167	0.0	3.8	2.3%
Milton	123	1.9	3.3	4.3%
Norwell	90	0.0	0.5	0.6%
Pembroke	109	0.0	1.1	1.0%
Quincy	220	0.0	1.6	0.7%
Randolph	114	0.0	0.9	0.8%
Rockland	56	0.0	1.9	3.4%
Scituate	120	0.0	5.2	4.3%
Weymouth	176	0.0	4.5	2.6%
TOTAL	1,855	2.0	39.0	2.2%

* Boston neighborhood

The bicycle accommodation coverage in the Southeast Corridor predominately consists of four-foot shoulders on roadways. The coverage varies from no coverage

in Duxbury to 5% in Cohasset. Overall, the Southeast Corridor ranks 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:

- Cohasset
- Duxbury
- Hingham
- Hull
- Milton
- Norwell
- Quincy
- Weymouth

Municipalities planning bike rack installations are:

- Braintree
- Rockland
- Scituate

Pedestrian

Table 7-2 shows the percentage of roadways in each of the Boston Region MPO municipalities in the corridor that have sidewalks on at least one side. The Boston neighborhoods of South Boston, North Dorchester, and South Dorchester are not included in this table but are included in Chapter 8, Central Area. The Boston neighborhood of Mattapan is included in this table, and is not included in Chapter 8.



TABLE 7-2

PERCENTAGE OF ROADWAYS WITH SIDEWALKS

MUNICIPALITY	TOTAL NON-INTERSTATE CENTERLINE MILES	CENTERLINE MILES WITH SIDEWALKS ON AT LEAST ONE SIDE	PERCENTAGE OF CENTERLINE MILES WITH SIDEWALKS
Mattapan*	35	31	89%
Braintree	143	76	53%
Cohasset	48	8	16%
Duxbury	128	2	2%
Hanover	96	20	21%
Hingham	130	47	36%
Holbrook	47	25	52%
Hull	53	18	35%
Marshfield	167	43	26%
Milton	123	74	60%
Norwell	90	7	7%
Pembroke	109	26	24%
Quincy	220	182	83%
Randolph	114	71	62%
Rockland	56	34	61%
Scituate	120	27	22%
Weymouth	176	94	54%
TOTAL	1,855	785	42%

* Boston neighborhood

The Southeast Corridor has the lowest sidewalk coverage of all of the radial corridors. The sidewalk coverage varies widely, from 2% coverage in Duxbury to 83% coverage in Quincy, with 89% coverage in the Boston neighborhood of Mattapan. Overall, the Southeast Corridor, with 42% coverage, ranks below the regional average of 50%.

LAND USE AND DEMOGRAPHICS

Demographics

Population

The largest densely populated areas in the Southeast Corridor are within Quincy, Hull, Weymouth, Randolph, and Braintree. The areas that are projected to become more densely populated between 2009 and 2035 include already-developed areas along the Red Line and commuter rail. In general, population is projected to remain relatively stable, with most municipalities experiencing moderate gains or losses (see Figure 7-3).

According to U.S. census data (updated annually at the town level), the corridor’s 2009 population was 406,590. In the Metropolitan Area Planning Council’s (MAPC’s) MetroFuture forecasts, the corridor’s population increases by 9%, to 442,020, by 2035 (MetroFuture is described briefly below). The municipalities projected to have the largest absolute growth are Weymouth, Hingham, Randolph, and Marshfield.

FIGURE 7-3

POPULATION DENSITY BY TRANSPORTATION ANALYSIS ZONE

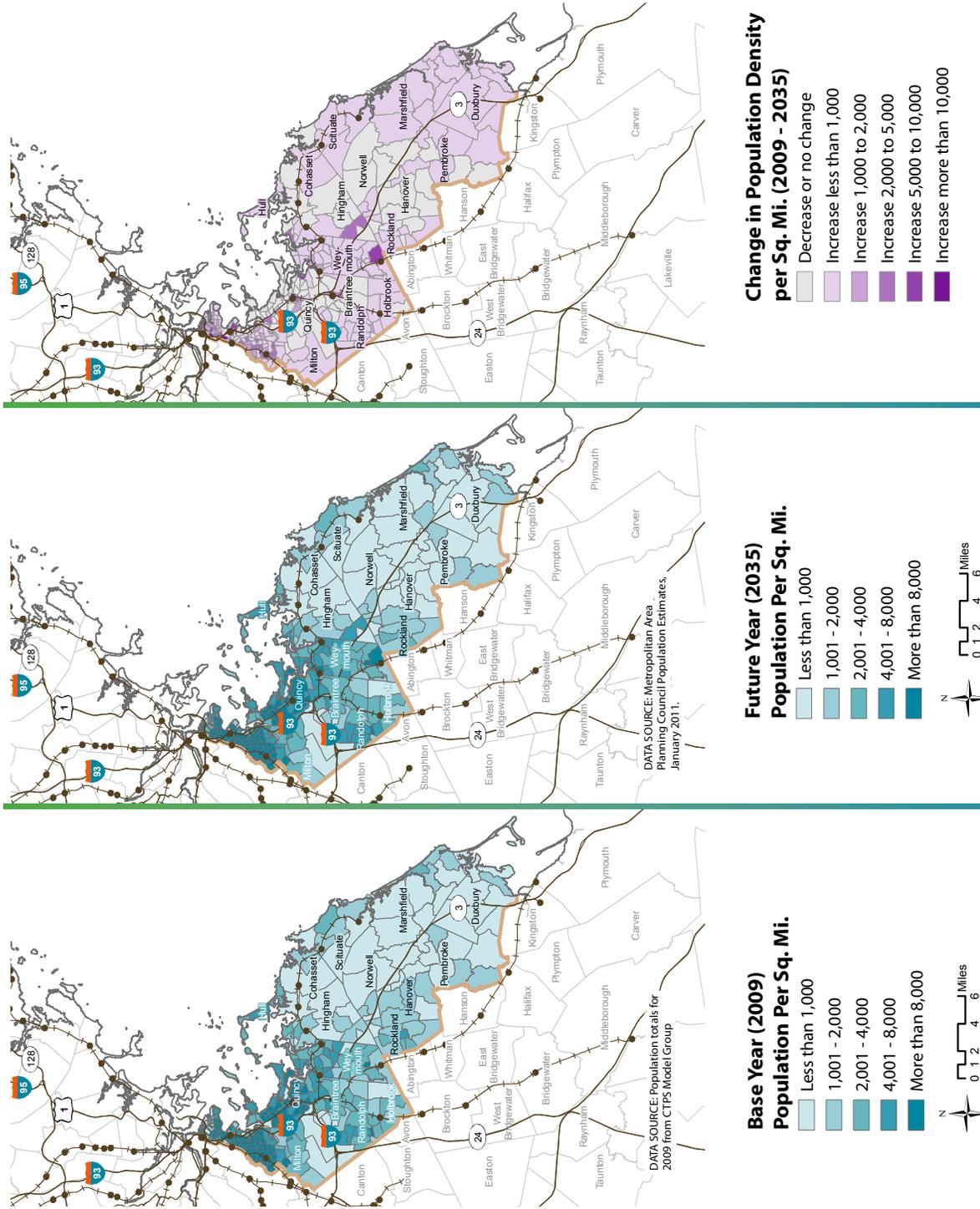


Figure 7-4 shows, by community for 2009, total elderly (age 70 or higher) population. This information can be used to assess the types of transportation services needed now and in the future. As shown in Figure 7-4, Quincy, Milton, Randolph, Braintree, and Weymouth currently have the highest populations of elderly residents.



Land Use, Housing, Sustainable Transportation

As of the year 2000, there were 151,200 households in the Southeast Corridor. The population is concentrated at the north end of the corridor; half the corridor's population and 60% of its employment is in Quincy, Weymouth, Braintree or Randolph. Quincy is by far the most urban community in the corridor, with population densities over 17,000 residents per square mile near the Wollaston Station.

Figure 7-5 shows transit service and catchment areas with population density in the Southeast Corridor; it includes commuter rail and rapid transit stations along with bus stops. For rapid transit, commuter rail, and commuter boat 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 Weymouth, Randolph, and Rockland do not have direct access to transit services.

From 2000 to 2009, Southeast Corridor municipalities issued building permits for 13,800 new housing units (according to the US Census Bureau), representing a housing unit growth of 9.1%. Fully one third of these units (4,500) were in Quincy, and more than 1,000 units were permitted in Hingham and Braintree. Cohasset and Holbrook both reported issuing permits for fewer than 200 units.

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In 2007 and again in 2010, MAPC surveyed municipalities about recent and anticipated development. Many of the largest developments completed or underway in the corridor are in the denser northern end and proximate to transit, though less often transit oriented. Large developments recently completed or under active construction in the corridor include Neponset Landing, a 280-unit apartment building in North Quincy; Linden Ponds, a 1,700 unit retirement community in South Hingham; 400+ units at the Hingham Shipyard, Jonathan's Landing in Braintree (318 units). Cohasset also has two multifamily developments now under construction, totaling 325 units—more than twice the number of building permits reported from 2000 – 2009. The largest recently completed commercial developments are along Route 3 in South Hingham and South Weymouth, 1.1 million square feet of retail, office, and medical developments at Derby Street Shoppes, Blue Cross/Blue Shield, and South Shore Hospital. The largest planned developments in the corridor are the SouthField

FIGURE 7-4

ELDERLY POPULATION BY TOWN - 2009

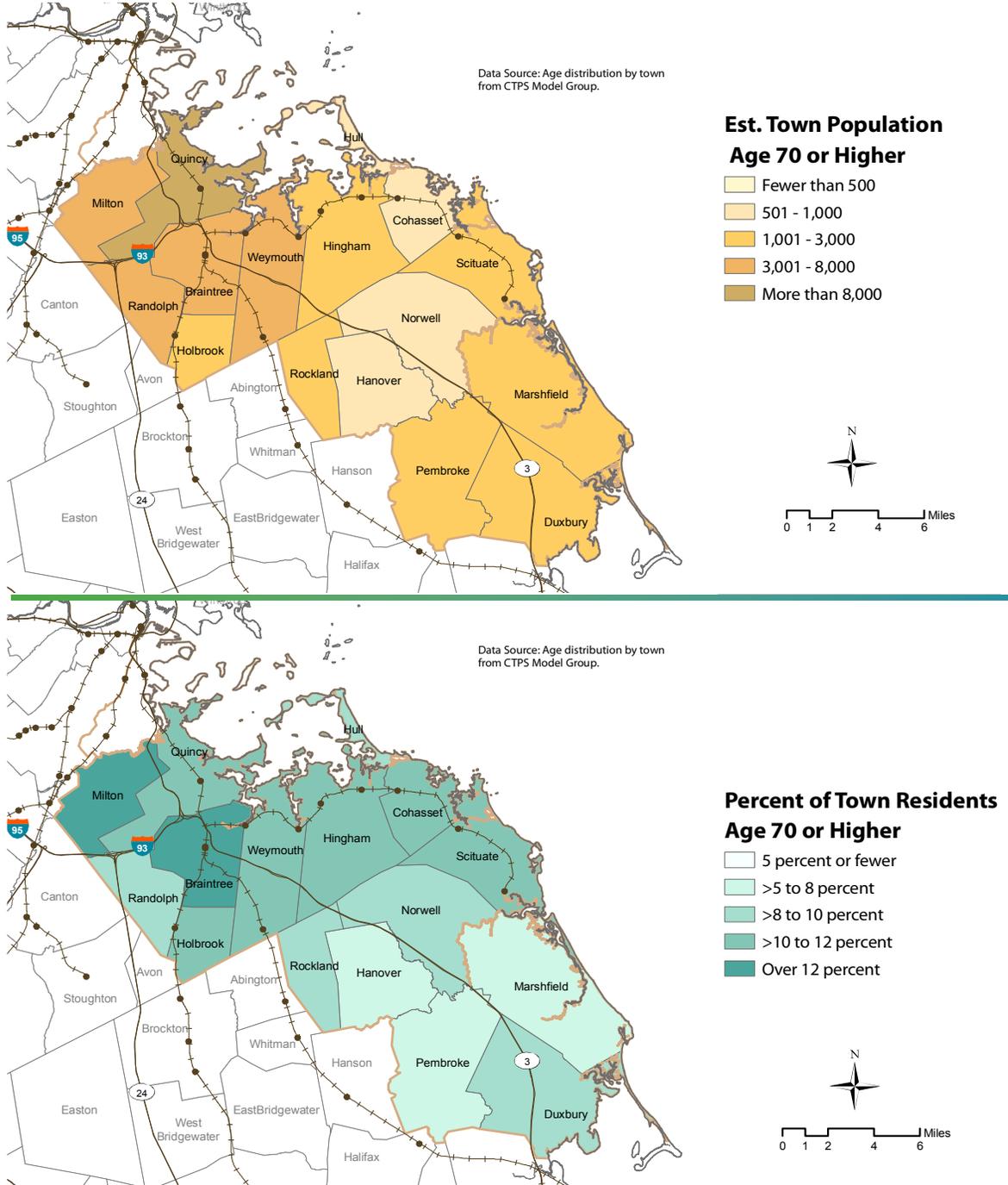
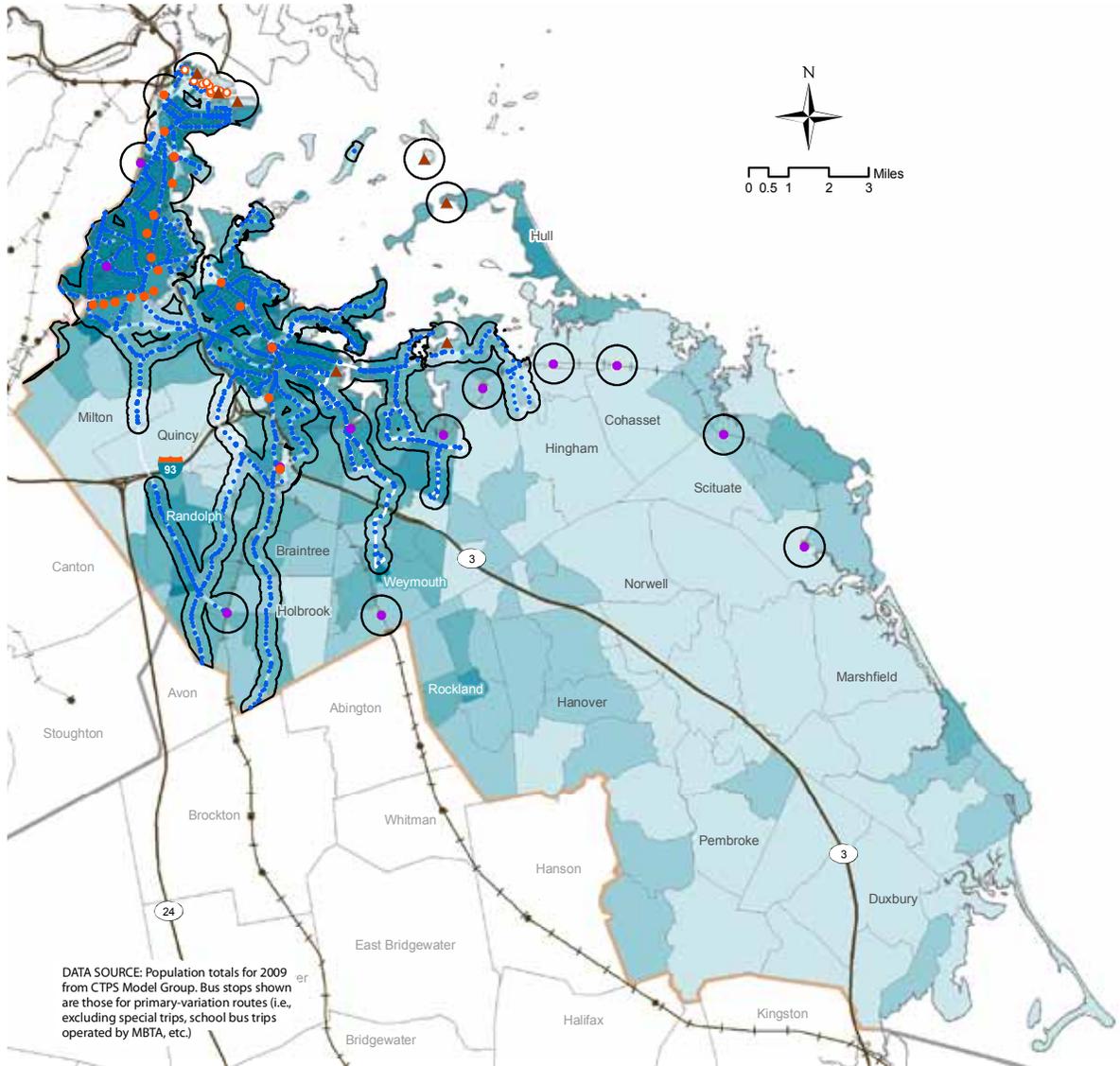


FIGURE 7-5

TRANSIT SERVICES CATCHMENT AREAS - SOUTHEAST



DATA SOURCE: Population totals for 2009 from CTPS Model Group. Bus stops shown are those for primary-variation routes (i.e., excluding special trips, school bus trips operated by MBTA, etc.)

Existing Transit Services and Catchment Areas

- Rapid transit station
- Silver Line stop
- Commuter rail station
- MBTA bus stop
- ▲ Boat docks
- Transit buffers (see text for varying distances)

2009 Population per Sq. Mi.

- Less than 1,000
- 1,001 - 2,000
- 2,001 - 4,000
- 4,001 - 8,000
- More than 8,000

and Quincy Center redevelopment projects. SouthField is slated to have 2 million square feet of commercial, office, and industrial space, and 3,800 new housing units of various types, oriented around the South Weymouth commuter rail station. The Quincy Center plan includes 1.3 million square feet of retail, office, and hotel uses and 800 housing units. Other large developments planned or permitted but not under construction include a 1,000-unit mixed-use redevelopment at the Fore River Shipyard and buildout of Enterprise Park in Marshfield.

Corridor-wide, auto ownership and average household mileage are markedly higher than the regional averages, at 1.8 autos per household and 57 miles per household per day. Quincy is the only municipality in the corridor where auto ownership and household mileage is less than the regional average (1.3 autos and 37 daily miles per household). The towns in the southern half of the corridor demonstrate the greatest auto-dependency, with more than 2 cars per household and daily mileage of 70 to 90 miles per household.

Employment

According to the Executive Office of Labor and Workforce Development, the number of jobs in the Southeast Corridor in 2009 was 160,900. Two thirds of this employment is in four municipalities in the north end of the corridor: Quincy, Braintree, Weymouth, and Hingham. Southeast Corridor employees commute an average of 17 miles round trip, with 8% accomplished by walking, biking, or transit. The longest commutes are in Norwell, Rockland, Braintree, Hanover, and Quincy. Despite Quincy's excellent transit resources, only 10% of commute miles to Quincy employment locations are accomplished by walking, biking, or transit. Employees live closer to their work in Hull, Holbrook, and Milton, with round trip commutes of less than 10.6 miles, and they are more likely to walk or bike to work.

MAPC's MetroFuture forecasts show employment increasing by 6%, to 175,200 by 2035, with most municipalities experiencing modest growth in absolute terms. The largest gains are expected in Weymouth and Quincy as a result of the SouthField and Quincy Center redevelopments. Smaller employment gains (10% or less of the corridor total) are projected for Braintree and Randolph.

MetroFuture Plan

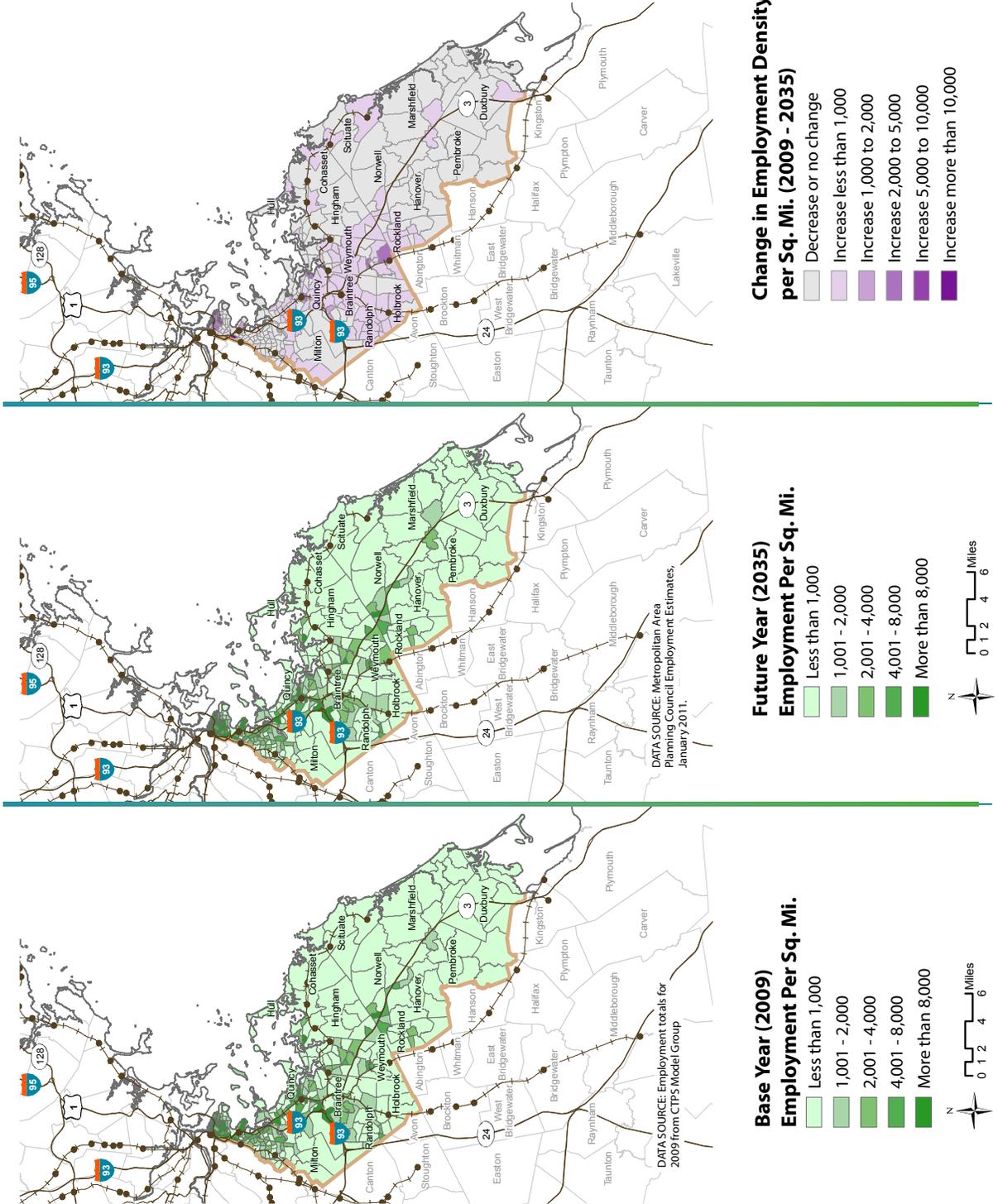
MetroFuture is a long-range plan for land use, housing, economic development, and environmental preservation in the Boston region comprising both a vision for the region's future and a set of strategies to achieve that future. The MetroFuture land use plan and associated socioeconomic projections are 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 Southeast



FIGURE 7-6

EMPLOYMENT DENSITY BY TRANSPORTATION ANALYSIS ZONE



Corridor includes one Regional Urban Center (Quincy). The remaining towns are Maturing Suburbs and Developing Suburbs.

The MetroFuture land use vision for the Southeast Corridor is built around continued redevelopment and reuse of commercial and industrial land proximate to the Red Line, commuter rail stations and in city and town centers such as Quincy, Braintree-Weymouth Landing, East Weymouth, and Holbrook. In these locations, new households will have the greatest access to transit and the highest proximity to common household destinations.

Economic development along 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 7-3. 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 7-3

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	Green Community
Braintree	•								•		•		•	•		•			
Cohasset	•		•	•							•		•	•					
Duxbury			•						•				•	•					
Hanover													•	•					•
Hingham	•								•		•		•	•		•		•	
Holbrook									•				•						
Hull			•						•				•				•		
Marshfield	•		•						•				•	•				•	
Milton	•								•			•	•			•		•	•
Norwell													•			•			
Pembroke		•							•		•		•	•		•			
Quincy	•	•		•		•		•			•		•	•				•	
Randolph	•				•				•		•		•	•					
Rockland	•						•		•	•			•				•		
Scituate				•					•				•	•		•	•		•
Weymouth	•						•		•	•	•		•	•	•				

TRAVEL CHARACTERISTICS

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

The most recent traffic information for highway and transit travel into Boston Proper from the Southeast Corridor is shown in Table 7-4. 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 7-4**AVERAGE DAILY HIGHWAY AND TRANSIT PERSON-TRIPS INTO BOSTON PROPER FROM THE SOUTHEAST CORRIDOR: 2008 AND 2030 NO-BUILD**

	2008 PERSON-TRIPS	2030 NO-BUILD PERSON-TRIPS
Highway	224,970	233,860
Transit	71,400	81,770
Total	296,370	315,630
Highway percentage	76%	74%
Transit percentage	24%	26%
Corridor's share of total person-trips into Boston	30%	30%

Table 7-5 gives the modal breakdown of the transit trips.

TABLE 7-5**AVERAGE DAILY TRANSIT PERSON-TRIPS BY MODE INTO BOSTON PROPER FROM THE SOUTHEAST CORRIDOR: 2008 AND 2030 NO-BUILD**

	2008 PERSON-TRIPS	2030 NO-BUILD PERSON-TRIPS
Bus	3,910	5,900
Rapid transit	56,800	62,070
Commuter rail	8,720	12,500
Contracted bus service	290	n/a
Ferry	1,680	1,300
TOTAL	71,400	81,770
Corridor's share of total transit trips into Boston	20%	21%

Inbound congestion levels on each of the three major modes of transit entering Boston Proper from the Southeast 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 7-6.

TABLE 7-6**AVERAGE DAILY CONGESTION LEVELS ON TRANSIT MODES WITH SERVICE INTO BOSTON PROPER FROM THE SOUTHEAST CORRIDOR (2008)**

MODE	BY SEATING CAPACITY	BY PLANNING CAPACITY
Bus	31%	16%
Rapid transit	35%	13%
Commuter rail	73%	61%

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

Southeast Corridor Travel Patterns

Figure 7-7 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 Southeast 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, 67% of person-trips in the 2008 base year and 67% of person-trips in the 2030 No-Build scenario remain in the inner Southeast Corridor (municipalities within the Boston Region MPO that are not part of the Central Area). The other top origins and destinations for person-trips in the inner Southeast Corridor are the outer Southeast Corridor (municipalities in the Southeast Corridor but not in the Boston Region MPO), the Southwest Corridor, and the Central Area. In total, travel within the Southeast and adjacent corridors accounts for 94% of all person-trips associated with the Southeast Corridor. The remaining 6% of person-trip travel to the remaining corridors.

The Central Area is the region's most prominent population and employment area and it includes portions of the City of Boston, such as Dorchester, that are in the Southeast Corridor. More than 10% of person-trips in the Southeast Corridor originate in or are destined for the Central Area. There is little change in the travel patterns of the Southeast Corridor between the 2008 base-year and the 2030 No-Build travel scenario.

The information above discusses person trips for all purposes (work-based, school-based, shopping, etc.). When looking at the 2000 census Journey-to-Work data for the Southeast Corridor, only 42% of the work-based trips (compared to 67% of all trips) remain within the Southeast Corridor, while almost 20% of the work-based trips (compared to about 10% of all trips) are destined to the Central Area.



Truck Travel

Daily truck trip-ends per square mile are shown in Figure 7-8 along with the locations of freight intermodal facilities. This figure shows that the highest concentrations of 2008 daily truck activity occur around the Conley Terminal in South Boston, along the I-93 corridor in Dorchester and Quincy, along Route 3A in Quincy, and at the Braintree Split where I-93 and Route 3 meet.

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

along Route 18 in the southern part of Weymouth, along Route 3 in Hingham, in Quincy Center along Route 3A, and in South Boston along the waterfront and near Conley Terminal.

FIGURE 7-7

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

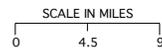
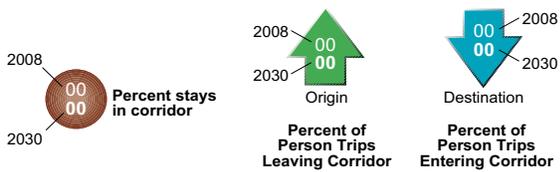
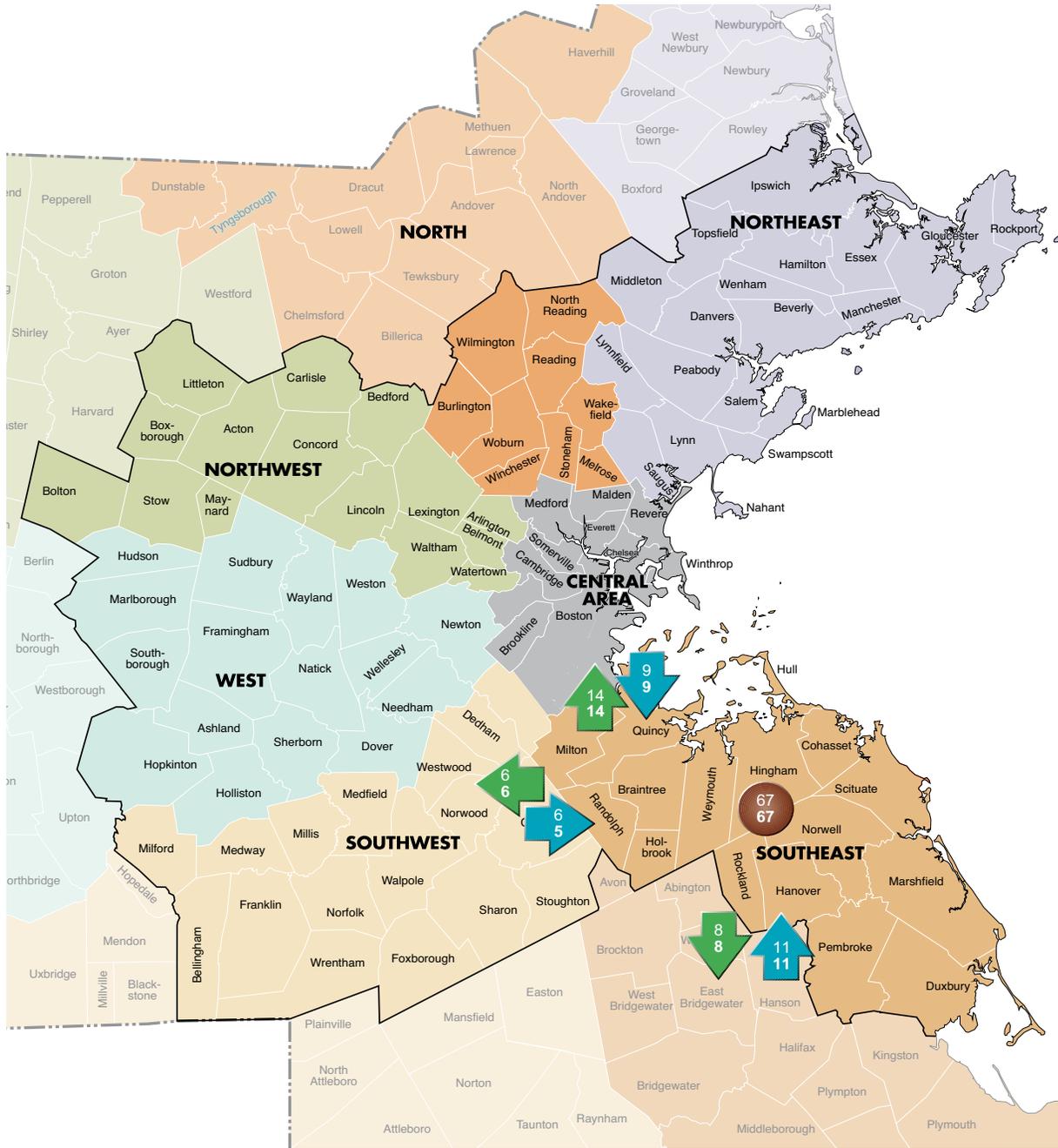
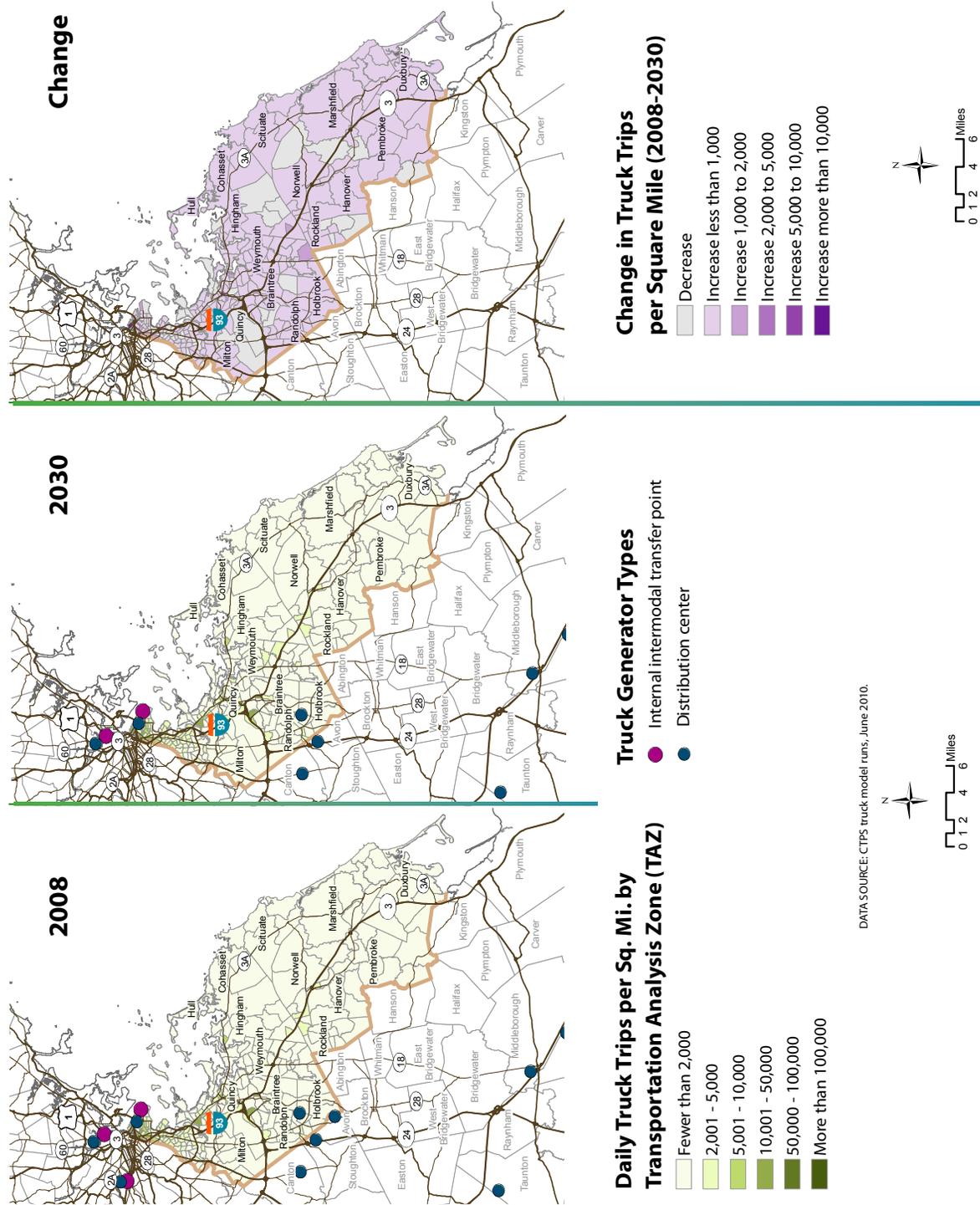


FIGURE 7-8

DAILY TRUCK TRIPS BY TRANSPORTATION ANALYSIS ZONE - SOUTHEAST



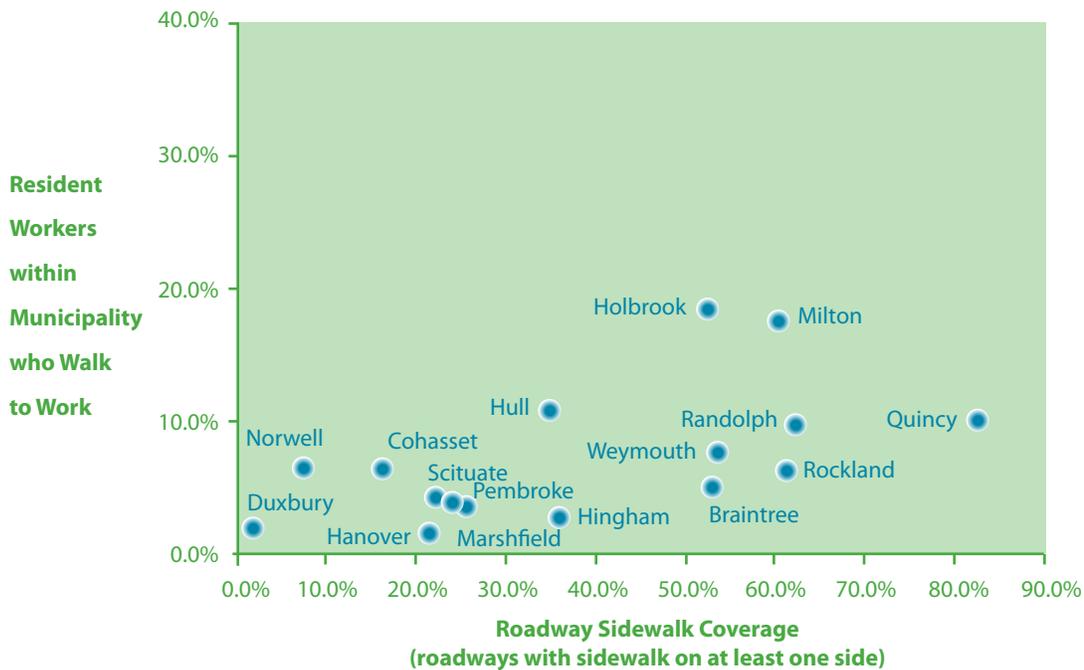
Bicycle and Pedestrian Travel

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

Walking conditions vary from poor to very good in the Southeast Corridor. Table 7-7 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.³) This table indicates the range in sidewalk coverage from 2% in Duxbury to 83% in Quincy, and walk share from 1.6% in Hanover to over 18.4% in Holbrook.

TABLE 7-7

RELATIONSHIP BETWEEN SIDEWALK COVERAGE AND RESIDENTS WHO WALK TO WORK



³ 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. The 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.

Bicyclists and pedestrians have been counted at several on-road facilities and one off-road facility in the Southeast Corridor. Table 7-8 contains the top counted locations by average AM weekday, PM weekday, and daily weekend peak-hour user volumes. Users are classified as bicyclists or pedestrians (people walking, jogging, skating, using wheelchairs, and pushing strollers).

TABLE 7-8

AVERAGE PEAK-HOUR BICYCLIST AND PEDESTRIAN VOLUMES

FACILITY NAME	AM WEEKDAY PEAK-HOUR VOLUMES		
	BICYCLISTS	PEDESTRIANS	TOTAL
North St. (Hingham)	6	16	22
FACILITY NAME	PM WEEKDAY PEAK-HOUR VOLUMES		
	BICYCLISTS	PEDESTRIANS	TOTAL
Granite Ave. (Milton)	1	99	100
Hancock St. (Quincy)	6	90	96
North Main St. (Randolph)	2	28	30
FACILITY NAME	DAILY WEEKEND PEAK-HOUR VOLUMES		
	BICYCLISTS	PEDESTRIANS	TOTAL
Neponset River Greenway (Boston)	13	24	37

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 375 bridges in the Southeast Corridor, 72 (19%) are classified as functionally obsolete, and 16 (4%) 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 156 bridges in the corridor that should meet this vertical clearance for trucks. Of these bridges, 123 (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 26 (7%) weight-restricted bridges in the Southeast Corridor.

Transit: Universe of Transit Preservation and Modernization Needs Identified for the Southeast 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 Southeast 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 commuter rail system, 12 bridges on the Fairmount Line are currently rated as structurally deficient. Work has commenced on some of these.

On the Red Line, upgrades at selected locations to track, power, and signal systems are needed. In addition, new Red Line cars must be purchased, so that the 1969 fleet can be retired. The Cabot maintenance facility is in need of renovations.

New vehicles are needed to replace the PCC cars on the Mattapan High Speed Line. These cars were originally built in the 1940s.

The Cabot and Quincy bus garages need some repairs and upgrades.

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:

- Wollaston (Red Line)
- Valley Road (Mattapan High Speed Line)

Freight

Weight-Restricted Tracks

The tracks in the Southeast 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, and deepening the Conley Terminal access channel to 48 feet. The channel into the Port of Boston is currently dredged to a depth of 40 feet.

Mobility



Highway Bottlenecks: Method for Identifying Them

A highway bottleneck is defined as a location where a constraint impedes the flow of traffic. 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 as follows:

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 highway and arterials can be identified using a number of methods. For identifying those in the Southeast 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 Southeast 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 7-9 for the AM peak period and Table 7-10 for the PM peak period, and also in Figures 7-9 and 7-10. Note that the tables include only Class I and II arterials; however, Figure 7-10 also shows Class III arterials. Many of the locations shown in Figure 7-10 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 7-15. 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 7-9

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

EXPRESS HIGHWAYS	SPEED INDEX
I-93/Southeast Expressway northbound from the beginning of the HOV Lane to Massachusetts Avenue (Boston, Milton, Quincy)	0.36 to 0.83
Rte. 3 northbound from Pond St. in Rockland to Union St. in Braintree (Weymouth, Braintree, Hingham, Rockland)	0.49 to 0.82
Rte. 24 northbound from Mazzeo Drive to the diverge to the I-93 on ramp (Randolph)	0.61-0.67
I-93 northbound from Rte. 24 to the Ponkapoag exit (Randolph, Milton)	0.74-0.83
I-93 southbound from the Rte. 3 1-mile sign to Rte. 37 (Randolph)	0.87
CLASS I & II ARTERIALS	SPEED INDEX
Morton St./Gallivan Blvd. from Rte. 28/Blue Hill Ave. to I-93 (Boston)	0.25 to 0.69

*Where multiple communities are listed for a roadway, they are in descending order of severity.

TABLE 7-10

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

EXPRESS HIGHWAYS	SPEED INDEX
I-93/Southeast Expressway from Massachusetts Ave. to the Braintree Split (Quincy, Boston, Milton)	0.36 to 0.82
Rte. 3 southbound from the Braintree Split to Union St. (Braintree)	0.49 to 0.70
I-93 @ Rte. 24 (Randolph)	0.57
I-93/Rte. 1 southbound from Rte. 138 to the I-93/ Southeast Expressway/Rte. 3 split (Canton, Milton, Randolph, Braintree, Quincy)	0.57 to 0.87
Rte. 24 southbound from the I-93 southbound off-ramp to the Rte. 24 southbound merge (Randolph)	0.9
CLASS I & II ARTERIALS	SPEED INDEX
Morton St./Gallivan Blvd. from Blue Hill Ave. to I-93 (Boston)	0.22 to 0.68

*Where multiple communities are listed for a roadway, they are in descending order of severity.

Volume-to-Capacity Ratio

The existing volume-to-capacity ratios (V/Cs) of express highway and arterial segments in the Southeast 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 7-11 and Figures 7-11 and 7-12 present the segments of roadways in the Southeast Corridor with the highest V/Cs during the AM peak period, listed in descending order of severity. Table 7-12 and Figures 7-11 and 7-12 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 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.

FIGURE 7-9

EXPRESS HIGHWAY TRAVEL SPEED INDEX (EXISTING CONDITIONS) AM AND PM:
SOUTHEAST CORRIDOR

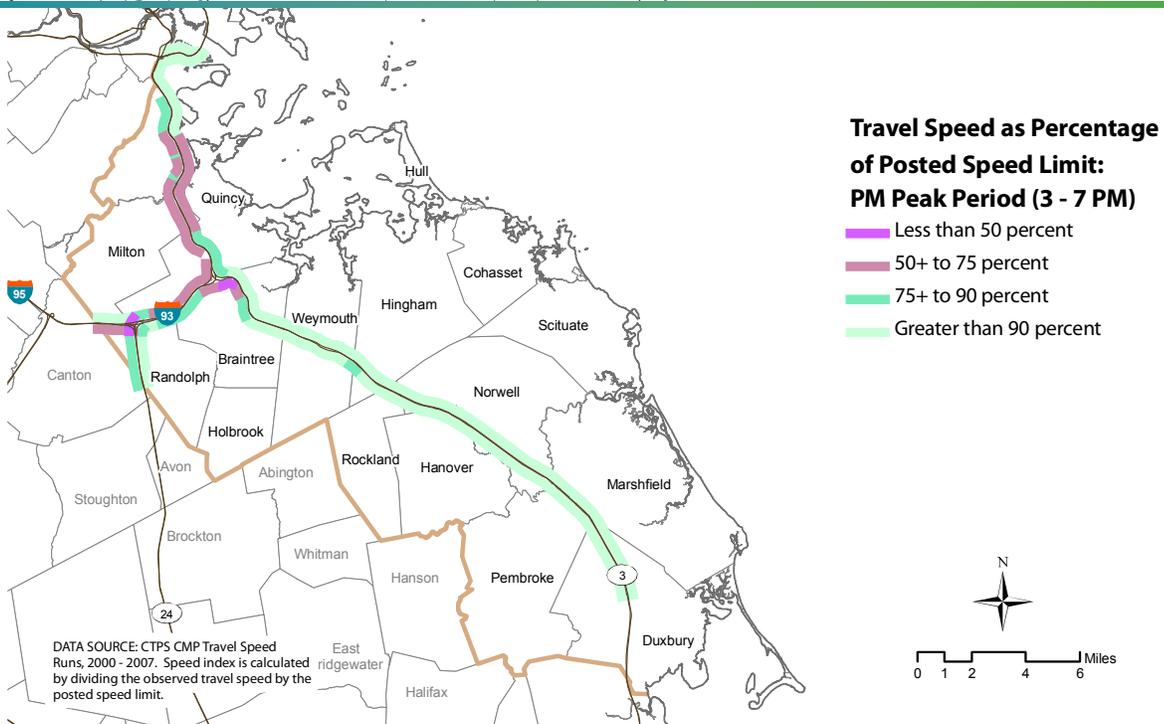
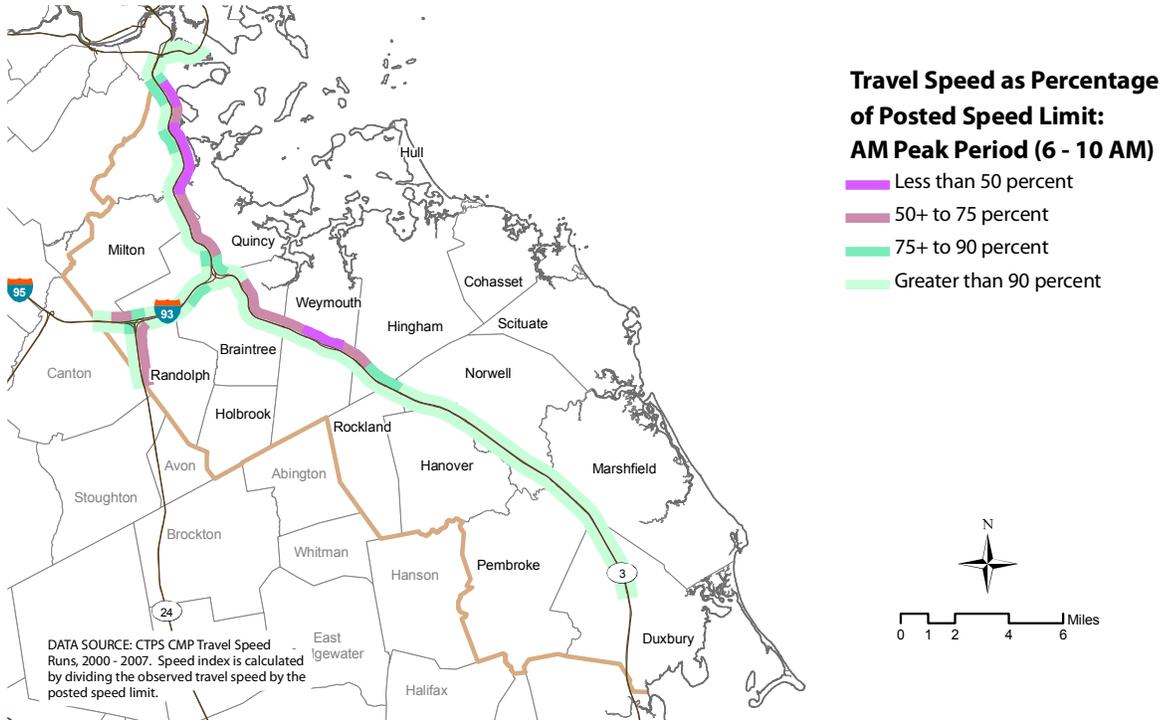


FIGURE 7-10

**ARTERIAL TRAVEL SPEED INDEX (EXISTING CONDITIONS) AM AND PM:
SOUTHEAST CORRIDOR**

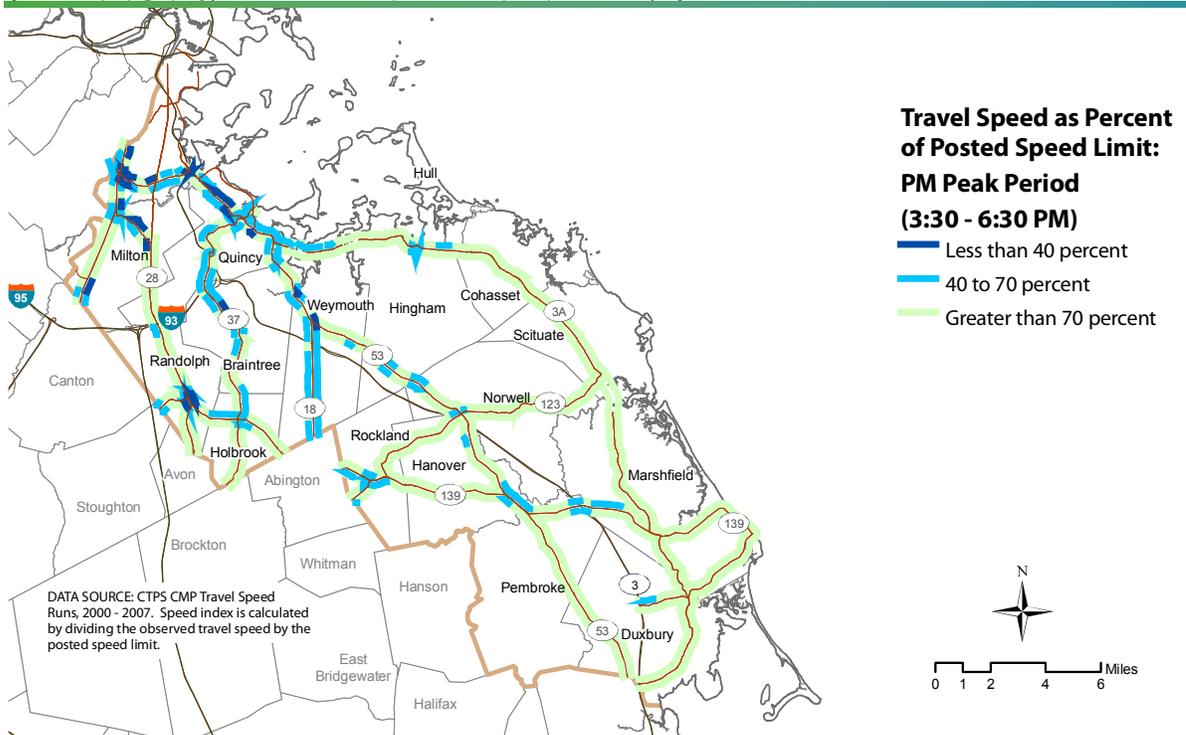
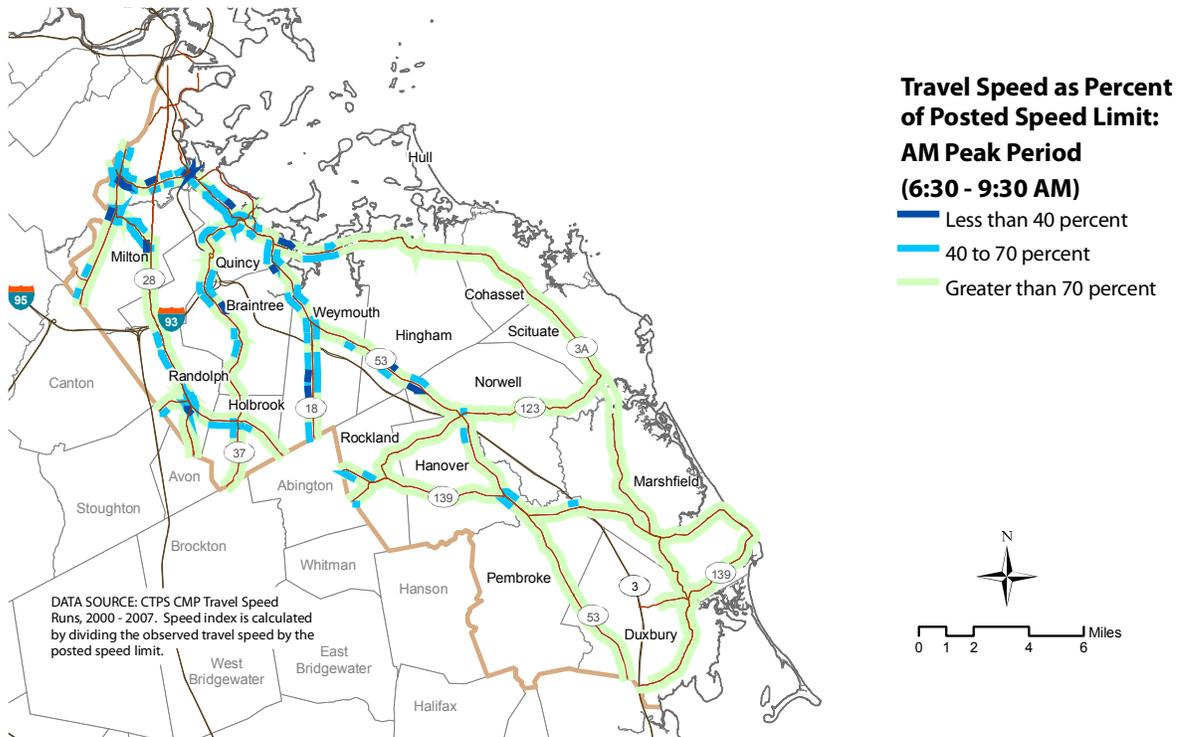


TABLE 7-11

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

EXPRESS HIGHWAYS	V/C
I-93/Southeast Expressway northbound from the Braintree Split to the I-90 interchange (Braintree, Quincy, Milton, Boston)	0.90 to greater than 1
I-93/Rte. 1 southbound from the Rte. 24 interchange to the Rte. 138 interchange (Randolph, Milton, Canton)	0.94 to greater than 1
Rte. 3 northbound from Marshfield to the Braintree split (Marshfield, Hanover, Rockland, Norwell, Hingham, Weymouth, Braintree)	0.72 to greater than 1
I-93/Rte. 1 northbound at Rte. 37 just before the Braintree split (Braintree)	0.95
Rte. 24 from Mazzeo Drive to the diverge to the I-93 on ramp (Randolph)	0.94
ARTERIALS	V/C
Rte. 18 in Weymouth	0.80 to greater than 1
Rte. 53 at the intersection with Rte. 139 (Hanover, Pembroke)	0.8 to greater than 1
Rte. 37 from the I-93 interchange to the intersection with Rte. 139 (Braintree, Holbrook)	0.71 to greater than 1
Rte. 28 from the interchange with I-93 to Avon (Randolph, Avon)	0.71 to greater than 1
Rte. 3A from the I-93/Southeast Expressway interchange to Hingham (Boston, Quincy, Weymouth, Hingham)	0.70 to greater than 1

TABLE 7-12

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

EXPRESS HIGHWAYS	V/C
I-93/Southeast Expressway southbound from William Morrissey Blvd. to the Braintree Split (Boston, Milton, Quincy, Braintree)	Greater than 1
Rte. 3 southbound from the Braintree Split to Marshfield (Braintree, Weymouth, Hingham, Rockland, Hanover, Norwell, Marshfield)	0.91 to greater than 1
I-93 southbound at the Rte. 37 interchange to south of Rte. 24 (Braintree, Randolph)	0.88 to greater than 1
Rte. 24 from Mazzeo Drive to the diverge to the I-93 on ramp (Randolph)	0.94
ARTERIALS	V/C
Rte. 139 (Marshfield, Pembroke)	0.9 to greater than 1
Route 18 (Weymouth)	0.85 to greater than 1
Rte. 37 from the I-93 interchange to the intersection with Rte. 139 (Braintree, Holbrook)	0.84 to greater than 1
Rte. 28 from the interchange with I-93 to Avon (Randolph, Avon)	0.83 to greater than 1
Rte. 53 at the intersection with Rte. 139 (Hanover, Pembroke)	0.8 to greater than 1

FIGURE 7-11

EXPRESS HIGHWAY VOLUME-TO-CAPACITY RATIO
2008, AM AND PM: SOUTHEAST CORRIDOR

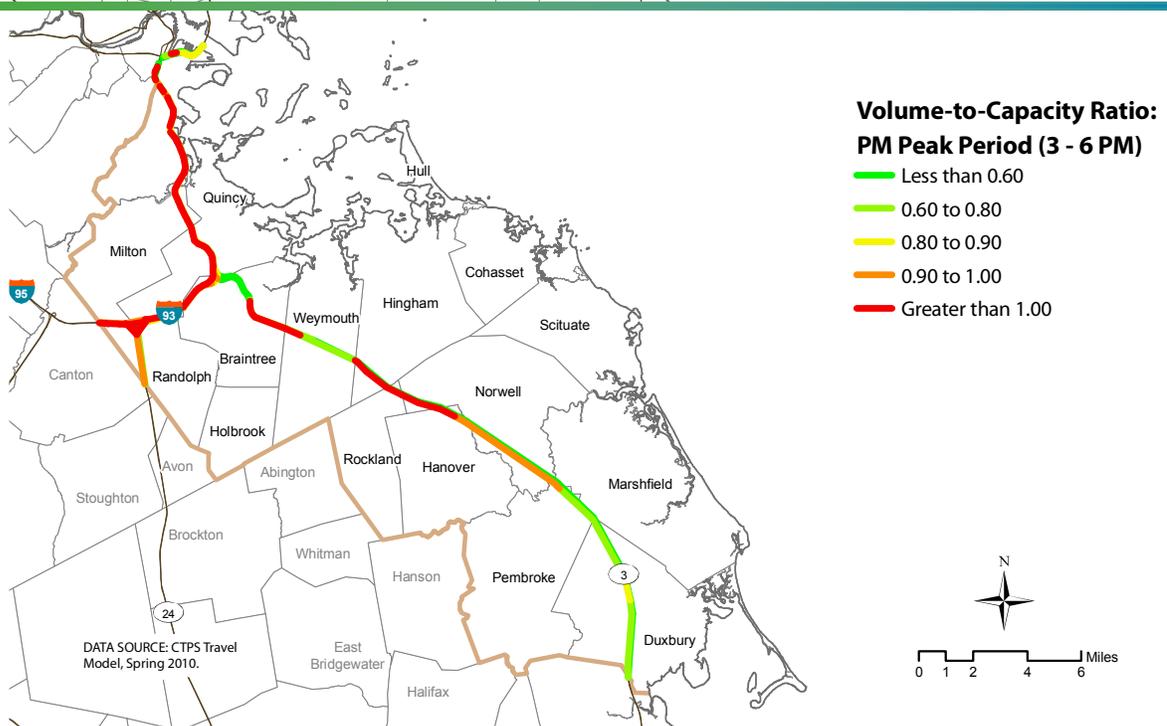
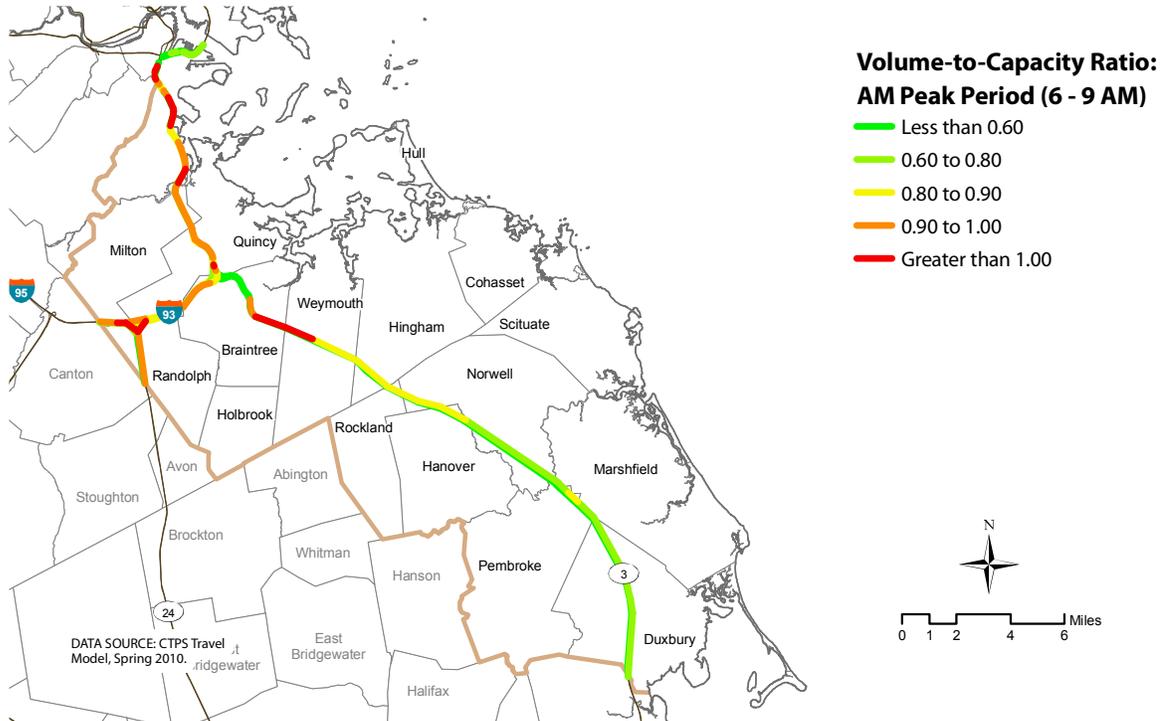
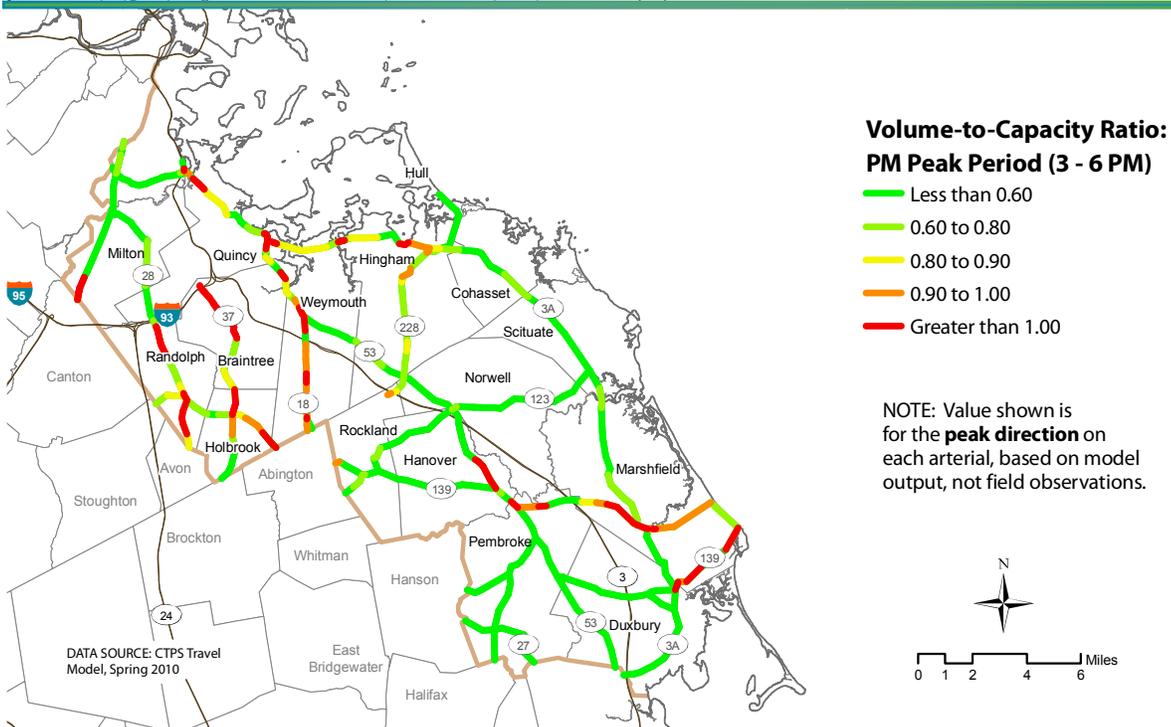
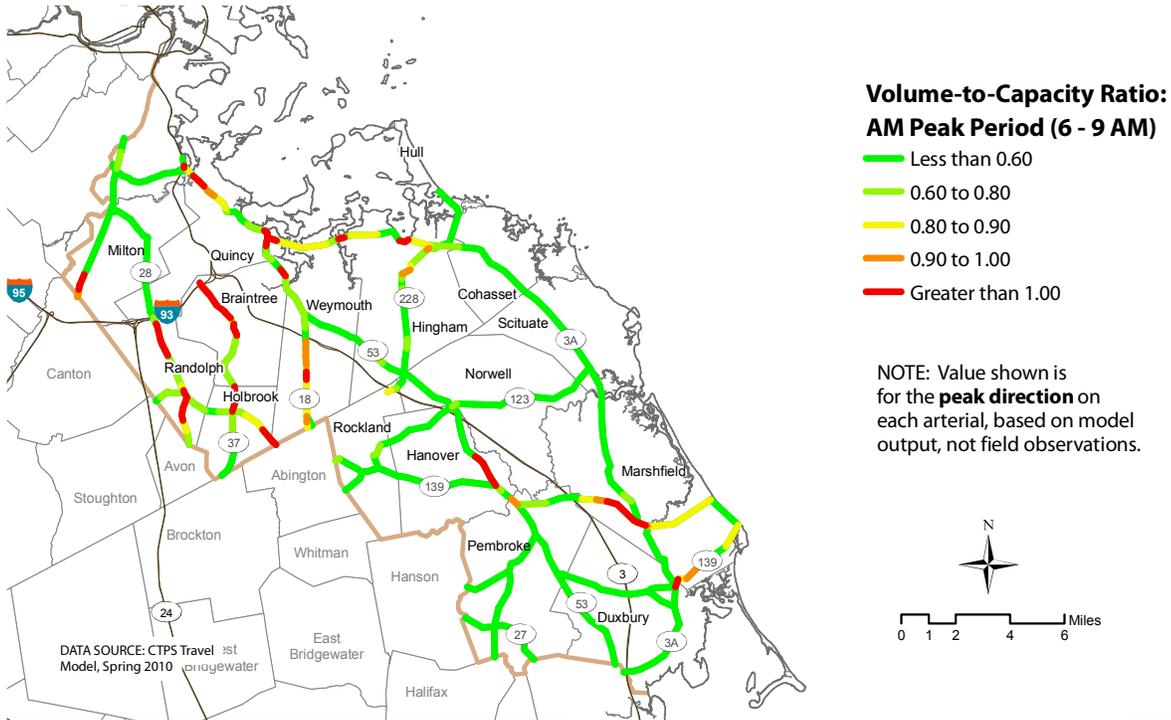


FIGURE 7-12

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



In addition, the Boston Region MPO's travel demand model was used to determine V/C for roadways under 2030 No-Build conditions. Table 7-13 and Figures 7-13 and 7-14 present the segments of roadways in the Southeast Corridor with the highest AM peak period V/Cs under the 2030 No-Build, again listing them in descending order of severity. Table 7-14 and Figures 7-13 and 7-14 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 7-13

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

EXPRESS HIGHWAYS	V/C
Rte. 24 from Mazzeo Drive to the diverge to the I-93 on ramp (Randolph)	Greater than 1
I-93 Southeast Expressway northbound from the Braintree split to the I-90 interchange (Braintree, Quincy, Milton, Boston)	0.95 to greater than 1
I-93/Rte. 1 northbound at Rte. 37 just before the Braintree split (Braintree)	0.97
Rte. 3 northbound from Marshfield to the Braintree split (Marshfield, Hanover, Rockland, Norwell, Hingham, Weymouth, Braintree)	0.8 to greater than 1
ARTERIALS	V/C
Rte. 53 at the intersection with Rte. 139 (Hanover, Pembroke)	Greater than 1
Rte. 37 from the I-93 interchange to the intersection with Rte. 139 (Braintree, Holbrook)	0.8 to greater than 1
Rte. 3A from the I-93 interchange to Hingham (Boston, Quincy, Weymouth, Hingham)	0.8 to greater than 1
Rte. 28 from the I-93 interchange to Avon, (Randolph, Avon)	0.8 to greater than 1
Rte. 139 (Marshfield, Pembroke)	0.8 to greater than 1

TABLE 7-14

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

EXPRESS HIGHWAYS	V/C
I-93/Southeast Expressway southbound from Morrissey Boulevard to the Braintree split (Boston, Milton, Quincy, Braintree)	Greater than 1
Rte. 24 from Mazzeo Drive to the diverge to the I-93 on ramp (Randolph)	Greater than 1
I-93 southbound at the Rte. 37 interchange to south of Rte. 24 (Braintree, Randolph)	0.94 to greater than 1
Rte. 3 northbound from Marshfield to the Braintree split (Marshfield, Hanover, Rockland, Norwell, Hingham, Weymouth, Braintree)	0.8 to greater than 1
ARTERIALS	V/C
Rte. 53 at the intersection with Rte. 139 (Hanover, Pembroke)	Greater than 1
Rte. 18 (Weymouth)	0.85 to greater than 1
Rte. 3A from the I-93/Southeast Expressway interchange to Hingham (Boston, Quincy, Weymouth, Hingham)	0.8 to greater than 1
Rte. 139 (Marshfield, Pembroke)	0.8 to greater than 1

FIGURE 7-13

EXPRESS HIGHWAY VOLUME-TO-CAPACITY RATIO
2030 No-BUILD, AM AND PM: SOUTHEAST CORRIDOR

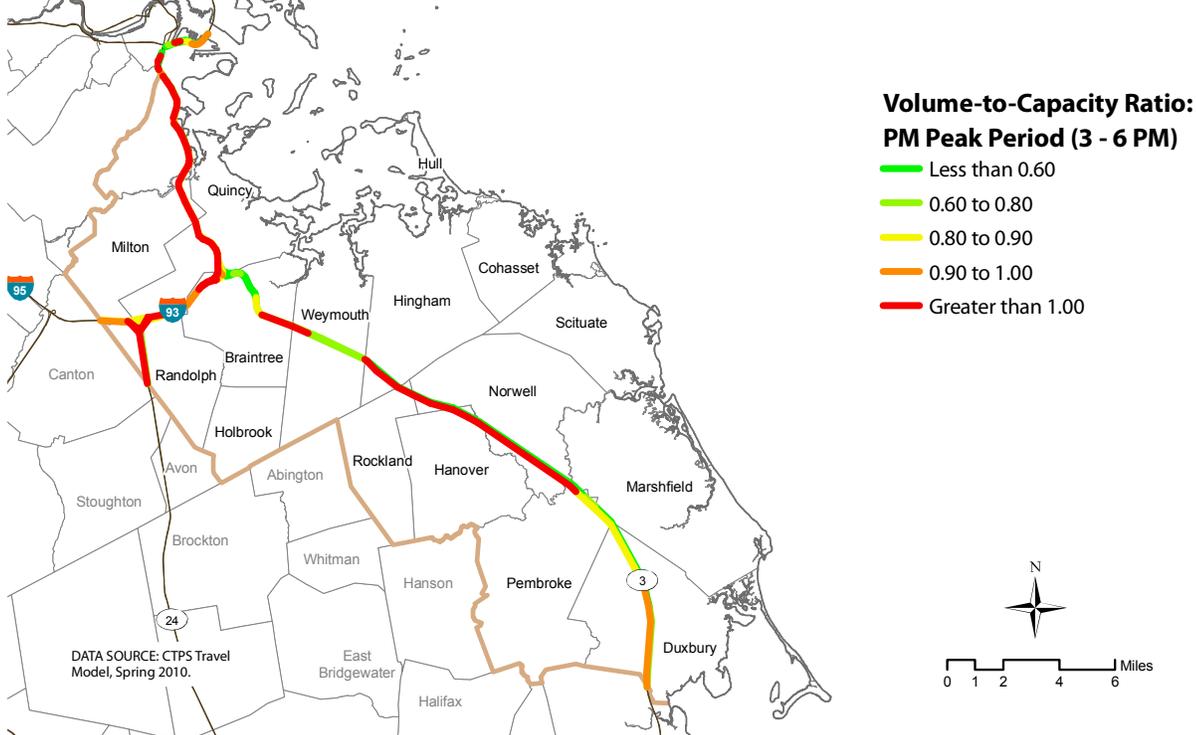
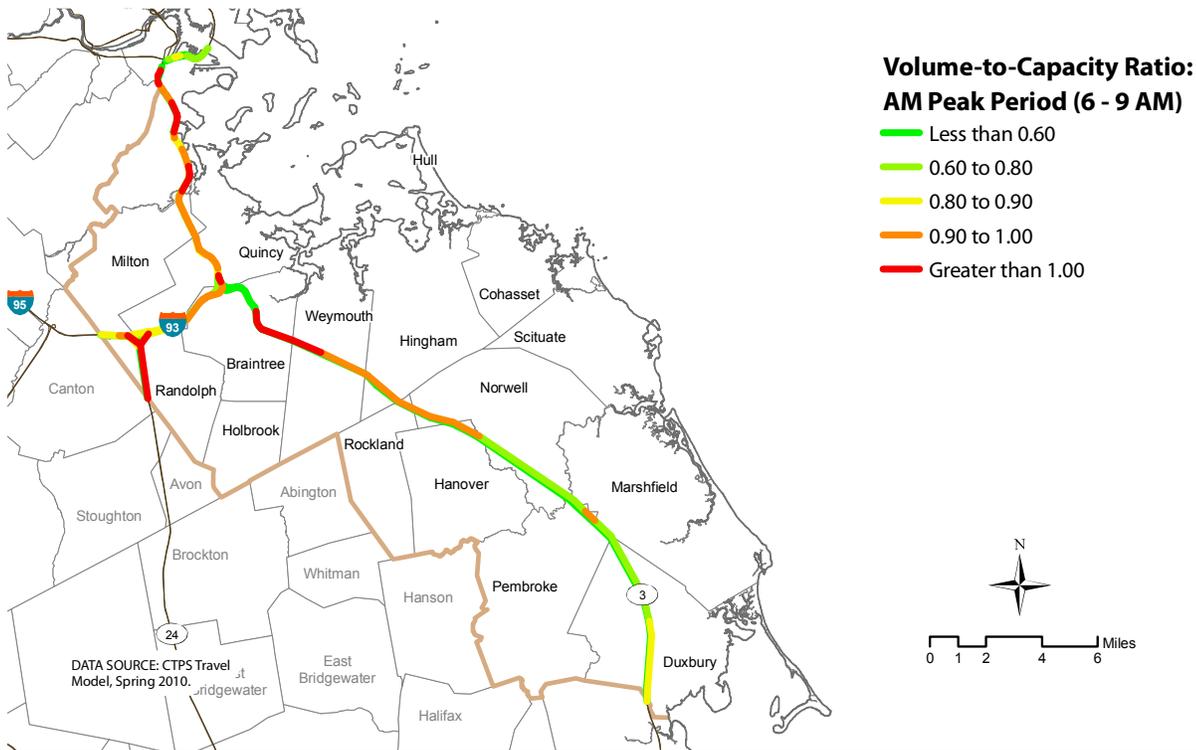
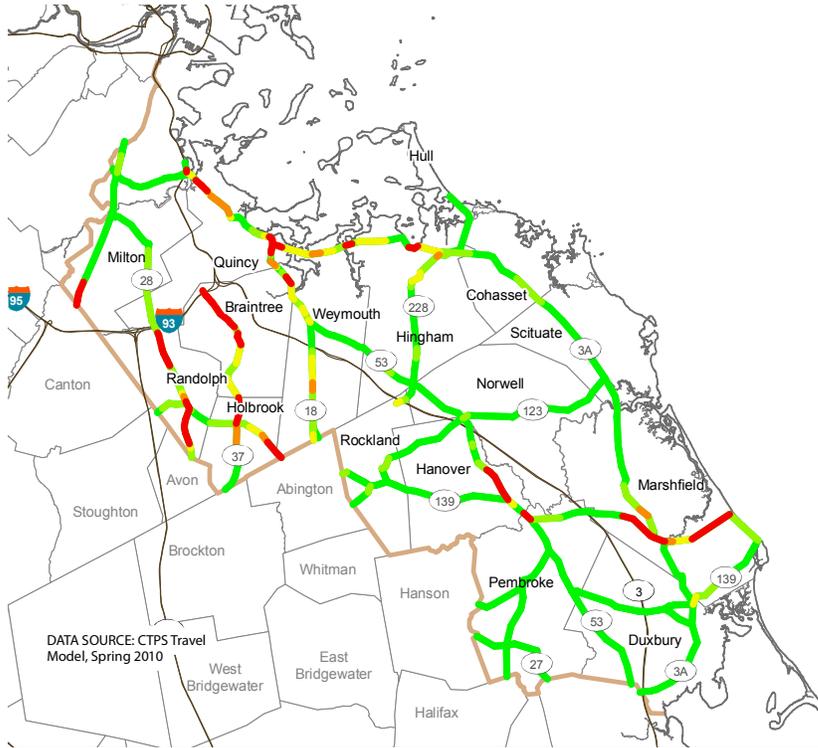


FIGURE 7-14

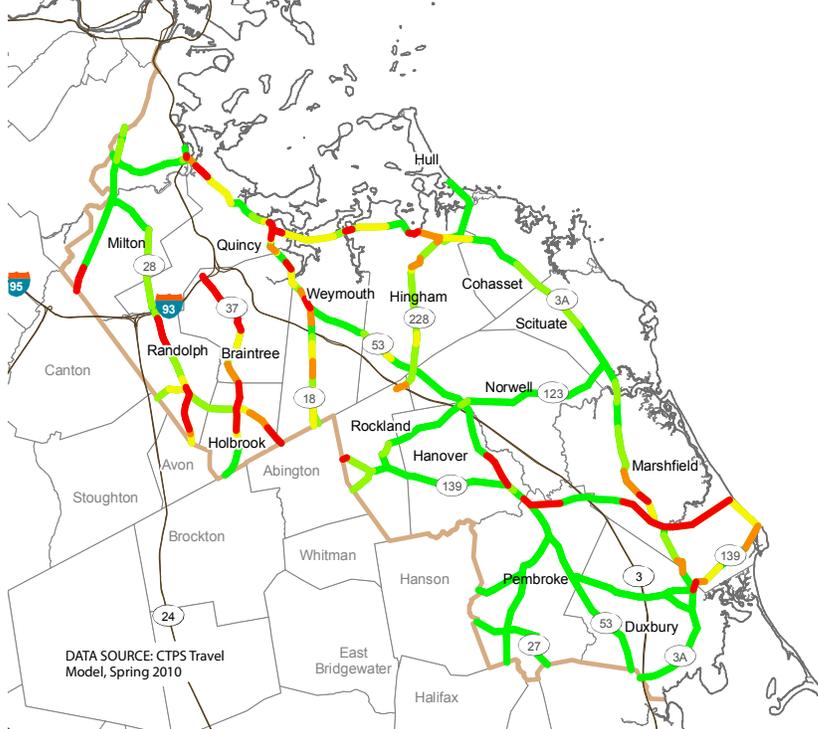
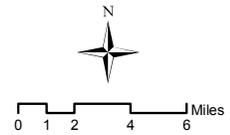
ARTERIAL VOLUME-TO-CAPACITY RATIO
2030 No-BUILD, AM AND PM: SOUTHEAST CORRIDOR



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

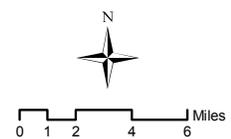
NOTE: Value shown is for the **peak direction** on each arterial, based on model output, not field observations.



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.



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 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 Southeast Corridor intersections that have been given priority by the CMP are shown in Figure 7-15. The roadways in the corridor that have clusters of priority intersections are (in roughly geographical order):

- Route 203 (Morton Street and Gallivan Boulevard) in Boston
- Morrissey Boulevard in Boston
- Route 28 in Boston, Milton, and Randolph
- Route 138 in Milton
- Route 3A in Quincy and Weymouth
- Route 53 in Quincy, Weymouth, Hingham, and Hanover
- Route 37 in Braintree
- Route 18 in Weymouth
- Route 228 in Hull

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

High-Occupancy Vehicle (HOV) Lanes in the Southeast Area

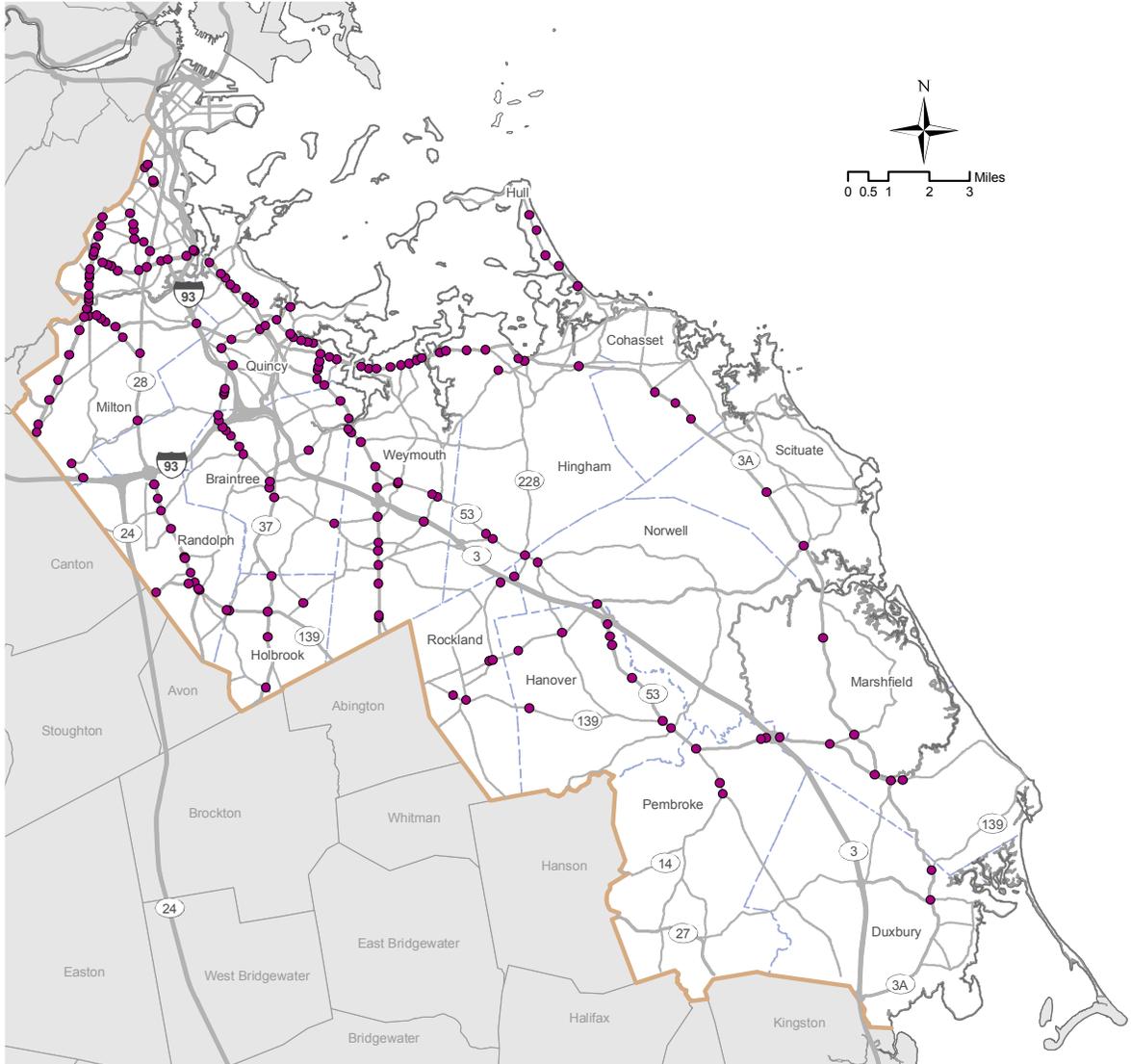
Southeast Expressway (I-93): Northbound HOV and General-Purpose Lanes

The Southeast Expressway northbound HOV lane currently operates between 6:00 AM and 10:00 AM. It extends northbound 5.5 miles from a point 0.24 miles north of the Interstate 93/Route 3 merge in Quincy to a point 0.9 miles south of the Columbia Road exit in Dorchester. The following issues have been observed:

1. Travel times in the HOV lane have been increasing gradually since 2002.
2. Travel times in the general-purpose lanes have been leveling off gradually since 2008.
3. The HOV lane is more efficient than the general-purpose lanes, as it carries 70 to 128 percent more persons per lane. It is also more efficient than the HOV lane on I-93 North.
4. The HOV lane is operating near capacity during the peak hour, given the geometry of the HOV merge with the general-purpose traffic at the north end of

FIGURE 7-15

CMP PRIORITY INTERSECTIONS, SOUTHEAST CORRIDOR



DATA SOURCE: Boston Region MPO
Congestion Management Program (CMP)

An intersection has been categorized as a "priority intersection" if it meets at least one of the following criteria:

- (a) high accident location.
- (b) high levels of approach delay greater than 80 seconds per vehicle as monitored through the CMP (all state numbered routes).
- (c) identified as such in an MPO study.

● Priority Intersections

the lane. From 2006 through 2010, it processed approximately 1,300 vehicles per peak hour.

5. The average time saved by using the HOV lane compared to the general-purpose lanes is more than seven minutes, which meets the Massachusetts Department of Environmental Protection’s threshold⁴.

Southeast Expressway (I-93): Southbound HOV and General-Purpose Lanes

The Southeast Expressway southbound HOV lane currently operates between 3:00 PM and 7:00 PM. Due to its contraflow design; it is identical in length and location to its northbound counterpart. The following issues have been observed:

1. Travel times in both the HOV and general-purpose lanes appear to have leveled off since 2006, and they have decreased slightly since 2009.
2. Although vehicle occupancy counts were not conducted for the southbound HOV and general-purpose lanes, it is likely that the HOV lane is more efficient than the general-purpose lanes, as was observed for its northbound counterpart.
3. Although the average travel times in the HOV lane are faster than the average travel times in the general-purpose lanes, the time savings the HOV lane offers do not meet the set of thresholds established by DEP.

Worst Highway Bottlenecks in the Southeast Corridor

Table 7-15 shows the locations that have been identified as the worst bottlenecks in the Southeast Corridor based on the three types of information presented above. This table indicates the criteria by which the location was identified as a bottleneck.

TABLE 7-15

WORST BOTTLENECK LOCATIONS

EXPRESS HIGHWAYS	SPEED INDEX	VOLUME TO CAPACITY	PRIORITY INTERSECTIONS
I-93 Southeast Expressway from the Braintree split to the I-90 interchange (Braintree, Quincy, Milton, Boston)	•	•	
I-93/Rte. 1 from Ponkapoag to the I-93/ Southeast Expressway/ Braintree split (Milton, Randolph, Braintree)	•	•	
Rte. 3 from the Braintree Split to Marshfield (Braintree, Weymouth, Hingham, Rockland, Norwell, Hanover, Marshfield)	•	•	
Rte. 24 from Mazzeo Drive to I-93 ramps (Randolph)	•	•	

(CONT.)

⁴ The HOV monitoring program is carried out in accordance with Massachusetts Department of Environmental Protection (DEP) regulation 310 CMR 7.37, which calls for samples of travel-time data from the HOV and general-purpose lanes to be collected and reported quarterly. The data are used to monitor compliance with a set threshold for the time savings afforded by the HOV lanes compared to travel in the general-purpose lanes. The DEP time-savings threshold was established at one minute per mile.

TABLE 7-15 (CONT.)

WORST BOTTLENECK LOCATIONS

ARTERIALS			
Rte. 3A from the I-93/Southeast Expressway interchange to Hingham (Dorchester, Quincy, Weymouth, Hingham)		•	•
Rte. 18 (Weymouth)		•	•
Rte. 28 from the interchange with I-93 to Avon (Randolph, Avon)		•	•
Rte. 37 from the I-93 interchange to the intersection with Rte. 139 (Braintree, Holbrook)		•	•
Rte. 53 (Quincy, Weymouth, Hingham, and Hanover)		•	
Route 138 (Milton)			•
Rte. 203 Morton St./Gallivan Blvd. from Rte. 28/Blue Hill Ave. to I-93 (Boston)	•		•
Route 228 (Hull)			•
Morrissey Blvd. (Boston)			•
Rte. 139 (Marshfield, Pembroke)		•	

Transit Mobility Needs Identified by the MBTA for the Southeast 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%.⁵ For commuter boat, the load standard is set at 100% of seated capacity. There are no capacity constraints on the commuter boat service in this corridor.

⁵ 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.

According to the most recent passenger counts available, the part of the Red Line that operates in the Southeast Corridor meets its vehicle load standard of an average of no more than 167 passengers per car at the peak load points in the AM and PM peaks. Recent data show that none of the commuter rail trips on the Fairmount, Middleborough/Lakeville, Kingston/Plymouth, and Greenbush lines, all of which serve the corridor, exceed the vehicle load standards. Tables 7-16 through 7-19 show the peak-period vehicle load ratios for the Fairmount, Middleborough/Lakeville, Kingston/Plymouth, and Greenbush lines.

TABLE 7-16

FAIRMOUNT LINE VEHICLE LOADS*

INBOUND AM PEAK					
Arrive South Station	7:02 AM	7:32 AM	8:25 AM	8:52 AM	
Assigned Seats	570	750	684	750	
Peak Load	53	125	178	36	
Peak Load/Seats	9%	17%	26%	5%	
OUTBOUND PM PEAK					
Depart South Station	3:30 PM	4:30 PM	5:10 PM	5:40 PM	6:30 PM
Assigned Seats	702	1,260	702	750	750
Peak Load	18	9	33	88	25
Peak Load/Seats	3%	1%	5%	12%	3%

* Excluding through trains from the Franklin Line

TABLE 7-17

MIDDLEBOROUGH/LAKEVILLE LINE VEHICLE LOADS

INBOUND AM PEAK					
Arrive South Station	6:17 AM	6:29 AM	6:58 AM	7:17 AM	9:05 AM
Assigned Seats	1,014	816	1,014	1,014	1,014
Peak Load	300	566	817	705	430
Peak Load/Seats	30%	69%	81%	70%	42%
OUTBOUND PM PEAK					
Depart South Station	3:43 PM	4:40 PM	5:12 PM	5:57 PM	
Assigned Seats	816	1,014	1,014	1,014	
Peak Load	411	742	776	617	
Peak Load/Seats	50%	73%	77%	61%	

TABLE 7-18

KINGSTON/PLYMOUTH LINE VEHICLE LOADS*

INBOUND AM PEAK				
Arrive South Station	6:29 AM	7:17 AM	8:10 AM	8:35 AM
Assigned Seats	816	1,014	1,014	1,080
Peak Load	426	786	860	798
Peak Load/Seats	52%	78%	85%	74%
OUTBOUND PM PEAK				
Depart South Station	4:20 PM	5:00 PM	5:38 PM	6:15 PM
Assigned Seats	1,014	1,014	1,080	816
Peak Load	451	569	770	444
Peak Load/Seats	44%	56%	71%	54%

* No Plymouth trains operate in the AM or PM peaks in this schedule

TABLE 7-19

GREENBUSH LINE VEHICLE LOADS

INBOUND AM PEAK				
Arrive South Station	6:38 AM	7:36 AM	8:02 AM	8:49 AM
Assigned Seats	702	702	702	702
Peak Load	211	359	536	596
Peak Load/Seats	30%	51%	76%	85%
OUTBOUND PM PEAK				
Depart South Station	4:02 PM	4:52 PM	5:20 PM	5:45 PM
Assigned Seats	816	702	702	702
Peak Load	283	353	522	354
Peak Load/Seats	35%	50%	74%	50%

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

- Silver Line Waterfront - Trunk Service, SL1, and SL2 (South Station - Logan Airport and Design Center) - 11,600 average daily boardings
- Route 23 (Ashmont Station - Ruggles Station) - 11,100 average daily boardings
- Route 28 (Mattapan Station - Ruggles Station via Dudley Station) - 10,600 average daily boardings
- Route 22 (Mattapan Station - Ruggles Station via Talbot Avenue) - 7,000 average daily boardings

Table 7-20 presents data on the performance of the Southeast Corridor bus routes. As shown by the routes' maximum load ratios (based on recent bus ridership counts) six routes in the Southeast Corridor fail the load standard, Silver Line service (Trunk, SL1, and SL2) and Routes 19, 23, and 238. Service adjustments have been made on all of these routes to try to alleviate the problems. Table 7-20 also shows the number of trips and percent of trips on each bus route serving the Southeast 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 7-20 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 7-20, 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.

TABLE 7-20

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
BRT	SL	Silver Line Way - South Sta.	Fail	183%	79%		99.2%	1,515
BRT	SL1	Logan Airport - South Sta.	Fail	147%	83%		99.8%	2,255
BRT	SL2	Design Center - South Sta.	Fail	182%	88%		99.3%	2,919
Local	4	North Sta. - World Trade Ctr.		86%	76%		99.8%	438
Local	5	City Point - McCormack Housing		55%	60%	Fail	100.0%	137
Local	7	City Point - Otis & Summer Sts.		119%	79%		99.0%	1,882
Local	8	Harbor Point /U Mass - Kenmore Sta.		102%	54%	Fail	99.4%	1,001
Local	9	City Point - Copley Sq. via Broadway		117%	73%	Fail	99.5%	1,810
Local	10	City Point - Copley Sq. Via Boston Med. Ctr.		85%	59%	Fail	99.7%	890
Local	11	City Point - Downtown via Bayview		103%	75%		99.9%	1,458
Local	16	Forest Hills Sta. - U Mass.		129%	61%	Fail	99.3%	1,219
Local	17	Fields Corner Sta. - Andrew Sta.		99%	72%	Fail	99.6%	1,063
Local	18	Ashmont Sta. - Andrew Sta.		55%	49%	Fail	100.0%	378
Local	19	Fields Corner Sta. - Kenmore Sta.	Fail	148%	52%	Fail	99.0%	713
Local	22	Ashmont Sta. - Ruggles Sta. via Jackson		120%	71%	Fail	99.2%	1,870
Local	23	Ashmont Sta. - Ruggles Sta. via Wash.	Fail	144%	73%	Fail	99.4%	2,648
Local	28	Mattapan Sta.. - Ruggles Sta. via Dudley		140%	69%	Fail	99.7%	2,331
Local	201	Fields Corner Sta. - Fields Corner Sta.		40%	67%	Fail	99.8%	912
Local	202	Fields Corner Sta. - Fields Corner Sta.		57%	47%	Fail	99.7%	733
Local	210	Quincy Ctr. Sta. - No. Quincy Sta.		52%	55%	Fail	100.0%	503
Local	211	Quincy Ctr. Sta. - Squantum		98%	62%	Fail	100.0%	441
Local	212	Quincy Ctr. Sta. - North Quincy Sta.		108%	72%	Fail	100.0%	210
Local	214	Quincy Ctr. Sta. - Germantown		98%	68%	Fail	99.9%	671
Local	215	Quincy Ctr. Sta. - Ashmont Sta.		102%	56%	Fail	100.0%	798
Local	216	Quincy Ctr. Sta. - Houghs Neck		64%	62%	Fail	99.9%	945
Local	217	Wollaston Beach - Ashmont Sta.		73%	59%	Fail	100.0%	200
Local	220	Quincy Ctr. Sta. - Hingham Ctr.		124%	66%	Fail	99.7%	943
Local	221	Quincy Ctr. Sta. - Fort Point		65%	67%	Fail	100.0%	84
Local	222	Quincy Ctr. Sta. - East Weymouth		99%	61%	Fail	99.9%	880
Local	225	Quincy Ctr. Sta. - Weymouth Landing		136%	61%	Fail	100.0%	1,258
Local	230	Quincy Ctr. Sta. - Brockton/Holbrook Line		82%	59%	Fail	100.0%	588
Local	236	Quincy Ctr. Sta. - South Shore Plaza		52%	62%	Fail	99.9%	336
Local	238	Quincy Ctr. Sta. - Holbrook/Randolph Sta.	Fail	142%	56%	Fail	100.0%	503
Local	240	Crawford Sq. - Ashmont Sta..		130%	62%	Fail	100.0%	1,019
Local	245	Quincy Ctr. Sta. - Mattapan Sta.		63%	67%	Fail	100.0%	336
Express	448	Marblehead - Dwtn. Crossing via Paradise		93%	51%	Fail	100.0%	53
Express	449	Marblehead - Dwtn. Crossing via Humphrey		98%	61%	Fail	100.0%	63
Express	459	Salem Depot - Downtown Crossing		98%	34%	Fail	100.0%	284

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 Cabot and Quincy garages (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.

Red Line rapid transit service, during July and August did not meet the MBTA's schedule adherence standard of 95% on-time performance, according to the November 2010 ScoreCard. This was due to the need to perform signal and track maintenance at Alewife Station. In June, September, and October, the schedule adherence standard was met. The average daily vehicle availability met the minimum requirement of 168 cars to operate the scheduled service in June through October, 2010, but the mean miles between failures were below the target level of 39,000 in July and October. This may be, at least in part, a reflection of the age of the No. 1 and No. 2 cars, which together comprise 60 percent of the Red Line fleet and have been in service since 1969 and 1988, respectively.



The ScoreCard shows that the Fairmount commuter rail line passed the schedule adherence standard, which requires that 95% of all trips departing and arriving at terminals be within 5 minutes of the scheduled departure and arrival times; the Greenbush, Kingston/Plymouth, and Middleborough/Lakeville lines did not. 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 Southeast Corridor and systemwide. According to the 2008 MBTA Service Plan, on time performance for all commuter boats and ferries ranged from 97 to 100%.

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 Southeast Corridor:

- By 2030, the largest growth in intratown trips is projected for areas that currently have limited existing transit services and, therefore, very low transit mode shares. In Weymouth, which has the third-largest projected intratown travel increase



in the Southeast Corridor, transit use currently accounts for only 1% of commuting trips and less than 0.5% of all trips. Current MBTA services in the north part of Weymouth include the Greenbush commuter rail line, with 2 stations, and bus Routes 220, 221, and 222. Route 225 extends for a short distance into the northwest part of town. Hingham, with the fourth-largest projected increase in intratown trips in the corridor, also has limited transit coverage, and a transit mode share of less than 1% for all trips made within the town. MBTA Route 220 runs across the north side of town and connects at Hingham Center with Route 714, and Route 222 extends into Hingham on the west side of town for a very short distance. Bus Routes 222 and 225 also provide service to

South Weymouth. The Greenbush commuter rail line stops at West Hingham and Nantasket Junction stations in the north part of town.

- By 2030, ridership demand on the Middleborough/Lakeville Line is projected to exceed capacity if six-car trains are still in use then.
- Modeling projections suggest that by 2030, growing demand on three bus routes in the Southeast Corridor may cause passenger-crowding levels that would trigger the need for additional service. These include routes 19, 22, and 28, which also operate in the Southwest Corridor.
- Some significant destinations in the southeast do not have direct rail transit service to Boston.
- Very densely populated areas in the corridor are currently served by MBTA bus Routes 23 and 28, but do not have frequent rapid transit access within a reasonable walking distance.
- Considerable residential growth has occurred in southern Middleborough, Wareham, and Bourne over the past decade, with substantial portions of these new residents commuting to Boston and Cambridge. However, no direct rail connections exist between these communities and the urban core.

- Capacity enhancements on the Old Colony Lines are limited by sections of single track.

Transit Station Parking Issues

- The current park and ride inventory shows that the following stations are utilized at 85% of capacity or greater:
 1. Braintree (Kingston/Plymouth Line and Middleborough/Lakeville)
 2. Braintree, Savin Hill, and Wollaston (Red Line)
 3. Butler (Mattapan High Speed Line)
 4. data not available for Hull (Ferry)
- For some customers, access to rail services is constrained by the lack of bicycle parking.

Connections with Other Regional Transit Authorities' Services

Both the Brockton Area Transit Authority (BAT) and the Greater Attleboro Taunton Regional Transit Authority (GATRA) serve the Southeast 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 24 at Interstate 93 and Interstate 93 southbound at Routes 3 and 128 (the Braintree Split) were identified in the MassDOT Freight Plan as among 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 61 bridges over rail lines in the corridor, 48 (79%) do not meet this desired height.

Railcar movement of containers stacked two high, also known as double stack, is currently prevented in the Boston region due to bridge height restrictions. This limits the ability of the Port of Boston to compete with other large U.S. ports.

"Last Mile" Connections

Massachusetts's seaports, like most other older seaports, have difficulty moving freight between their facility and major highways. Interposed are districts of local or

residential streets. Freight trains do not directly access the Port of Boston at Conley Terminal.

Overweight-truck Routes

The 2007 Boston Region Freight Study found that there is a lack of overweight-truck routes in the Port of Boston area. Containers often arrive at the port exceeding the weight allowed on roads in the region. In order to travel on the roads, the containers must be reconfigured to a lower weight. Overweight truck routes serving the port will improve the efficiency of freight operations, as shippers would save time and be able to use fewer trucks to move the same amount of freight.

Transport of Hazardous Materials by Trucks

There is a long-standing prohibition against trucks carrying hazardous cargoes traveling in tunnels. The expressway segments impacted by this prohibition include Interstate 90 from the Prudential Center to Logan Airport, Interstate 93 through the Tip O'Neill Tunnel, including the Zakim Bridge, and Route 1 passing under City Square in Charlestown and over the Tobin Bridge. The process of establishing alternate routes involves federal, state, and municipal regulations, and the alternate route system is undergoing review as of this writing. The route designation that emerges from this process can have a material impact on the costs and efficiencies of regional fuel transportation. Restrictions have an effect on regional trucking patterns.

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 trip 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 Southeast Corridor's bicycle network limit users' ability to safely connect to their destinations. Unlike the Northwest and West corridors, the Southeast Corridor lacks a bicycle corridor to Boston, and east-west connectors are limited. There is a gap in the Boston-Cape Cod Corridor of MassDOT's Bay State Greenway Plan between the Neponset River Greenway and the Shining Sea Bikeway and the Cape Cod Rail Trail. The low coverage of the current bicycle network limits users from accessing activity generators, including transit stations, schools, recreation destinations, and commercial areas.

Although providing bicycle parking at

stations and racks on buses encourage riders to access transit services by bicycle, poor access to stations can limit their utilization. Currently, the Neponset River Greenway provides bicycle access to Central Avenue, Milton, and Butler Stations of the Mattapan High Speed Line. However, almost all other transit stations in the Southeast Corridor lack bicycle access. There are no on-road or off-road bicycle accommodations to the Red Line of the rapid transit system, the Fairmount Line, Greenbush Line, Kingston/Plymouth Line, and Middleborough/Lakeville Line of the commuter rail system, or commuter boat terminals.

The Southeast 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 2% coverage in Duxbury to a high of 83% coverage in Quincy and 89% in Mattapan. Gaps in the pedestrian network limit users from accessing 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 JFK/UMass Station in Dorchester and Cohasset Station to good access at Ashmont Station in Dorchester and Stoughton Station. 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 7-16 identifies the top crash cluster locations in the Southeast Corridor. It shows that the locations in this corridor with the highest EPDO values are located on Interstate 93 and Route 3. This corridor has some of the worst crash clusters based on EPDO value. Specifically, the locations with the highest EPDO values (shown in parentheses below) are:

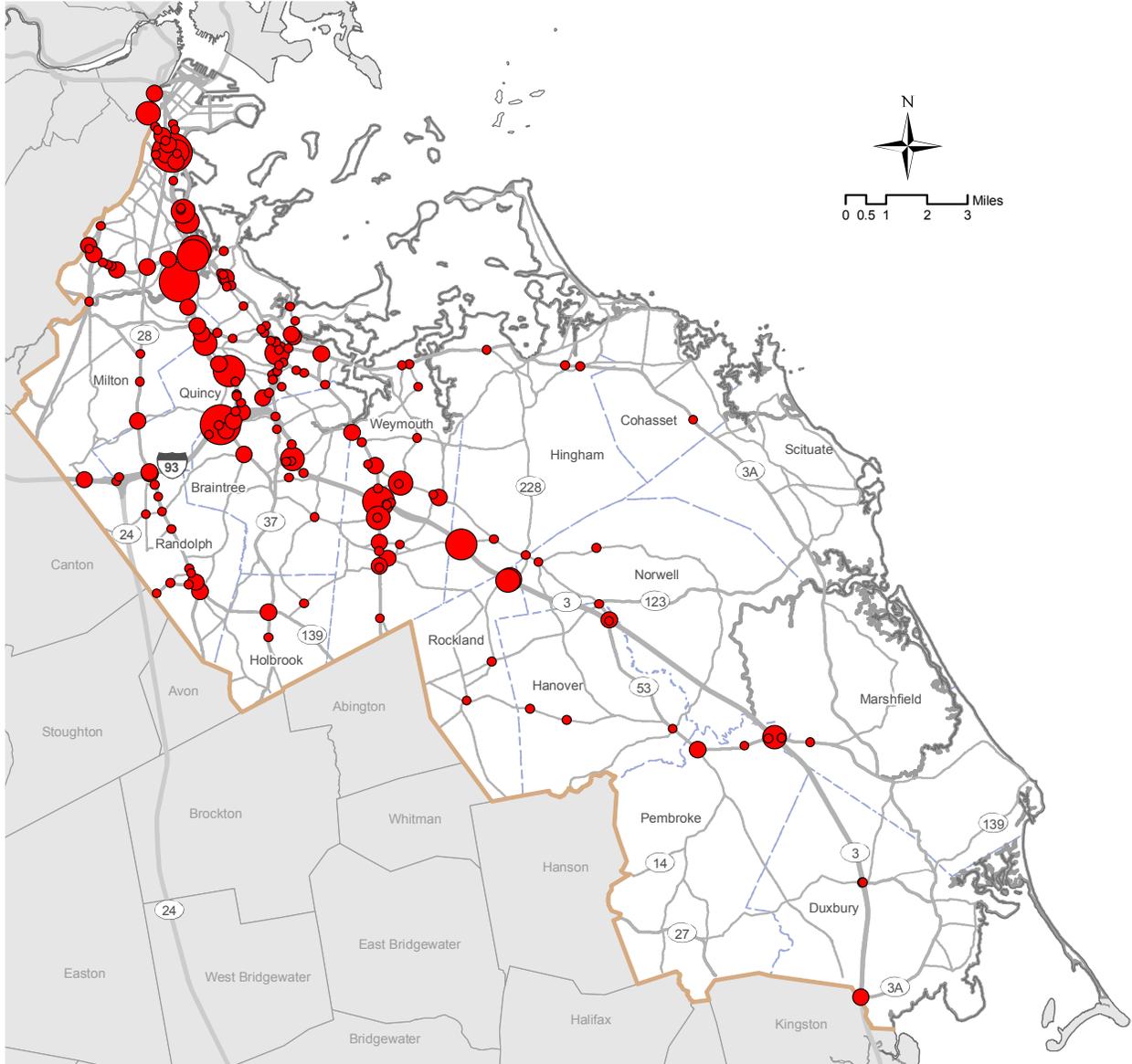
- Interstate 93 at Granite Street, Braintree (795)
- Interstate 93 at Columbia Road, Boston (697)
- Interstate 93 at Granite Avenue, Milton (615)
- Route 3 at Route 18, Weymouth (489)
- Interstate 93 near the ramps to Furnace Brook Parkway, Quincy (460)

Environment

Figures 7-17 through 7-19 provide an overview of environmental constraints in the Southeast Corridor. They include:

FIGURE 7-16

TOP FIVE PERCENT OF CRASH CLUSTER LOCATIONS - SOUTHEAST CORRIDOR



DATA SOURCE: MassDOT Crash Clusters
 The top 5% crash cluster locations were selected based on their Equivalent Property Damage Only (EPDO) values. EPDO is used to determine the severity of each crash cluster location. EPDO is calculated for each cluster by assigning a value of 10 if a crash involves a fatality, a 5 if a crash involves an injury, and a 1 if a crash results in property damage only. The centroid point for each of the clusters was determined and is used to display the EPDO data on this map.

Top 5 Percent Crash Cluster Locations (EPDO Values)

- 100 or less
- 101 to 200
- 201 to 300
- 301 to 500
- Greater than 500

FIGURE 7-17

DEP WETLANDS/FEMA FLOOD ZONES - SOUTHEAST

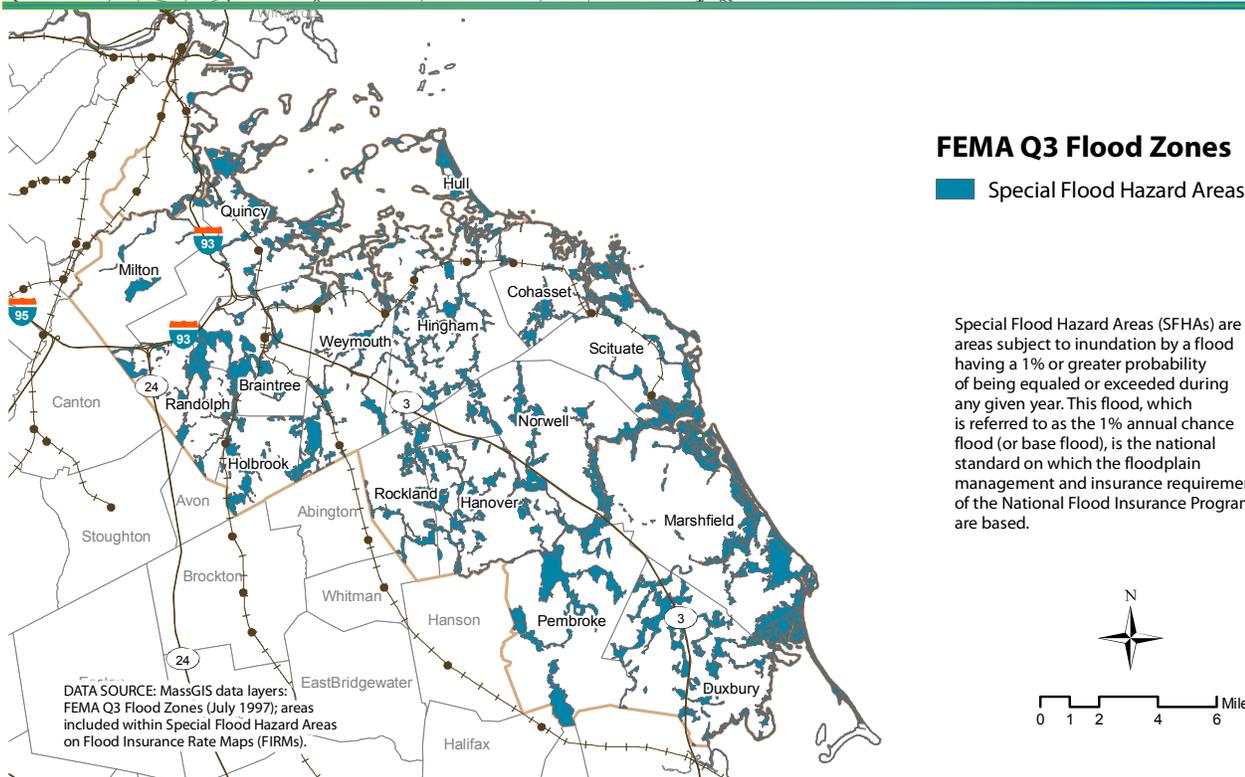
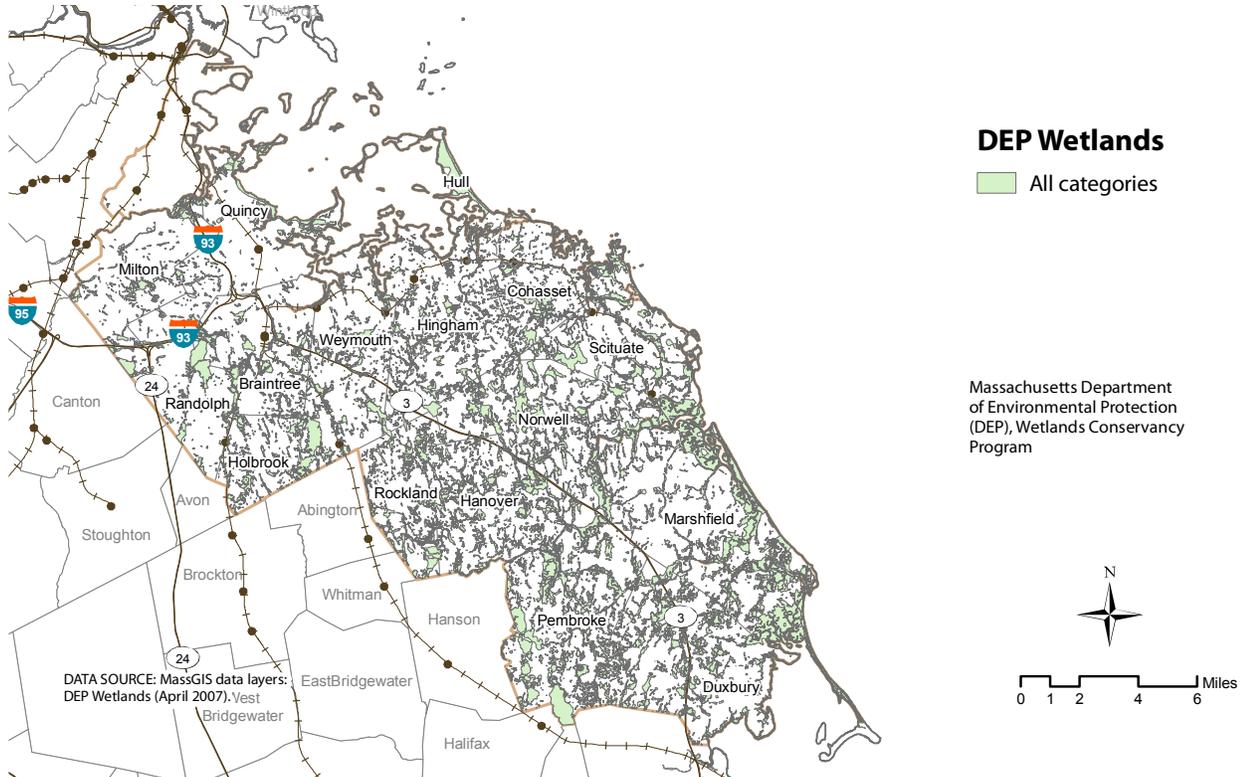
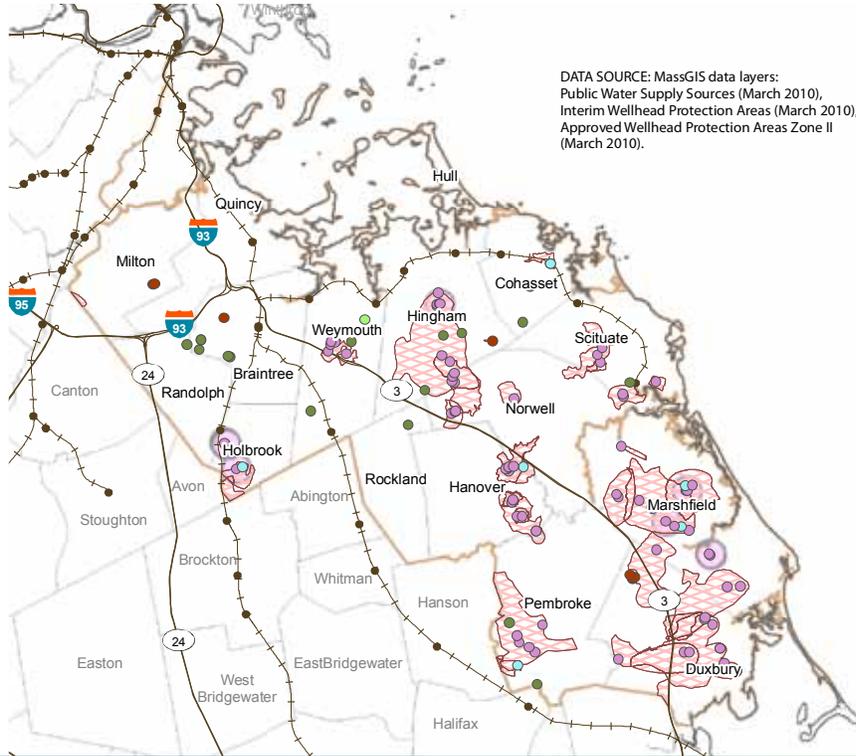


FIGURE 7-18

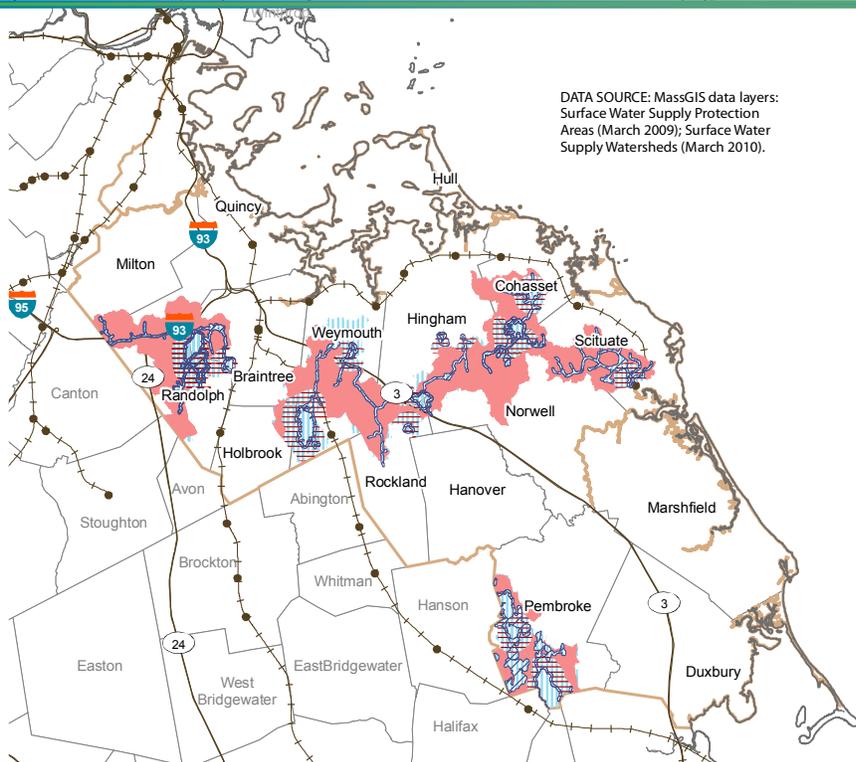
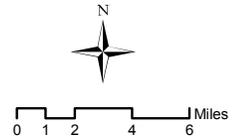
PUBLIC WATER SUPPLY/SURFACE WATER PROTECTION AREAS - SOUTHEAST



DATA SOURCE: MassGIS data layers:
Public Water Supply Sources (March 2010),
Interim Wellhead Protection Areas (March 2010),
Approved Wellhead Protection Areas Zone II
(March 2010).

Public Water Supplies

- Groundwater
- Transient noncommunity
- Nontransient noncommunity
- Surface water
- Emergency surface water
- Proposed well
- ▨ Wellhead protection area Zone II
- ▨ Interim wellhead protection area



DATA SOURCE: MassGIS data layers:
Surface Water Supply Protection
Areas (March 2009); Surface Water
Supply Watersheds (March 2010).

Surface Water Protection Areas

- ▨ Zone A
- ▨ Zone B
- ▨ Zone C

Surface Water Supply

- ▨ Watershed Areas

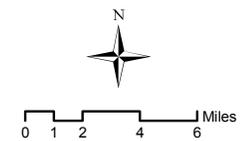
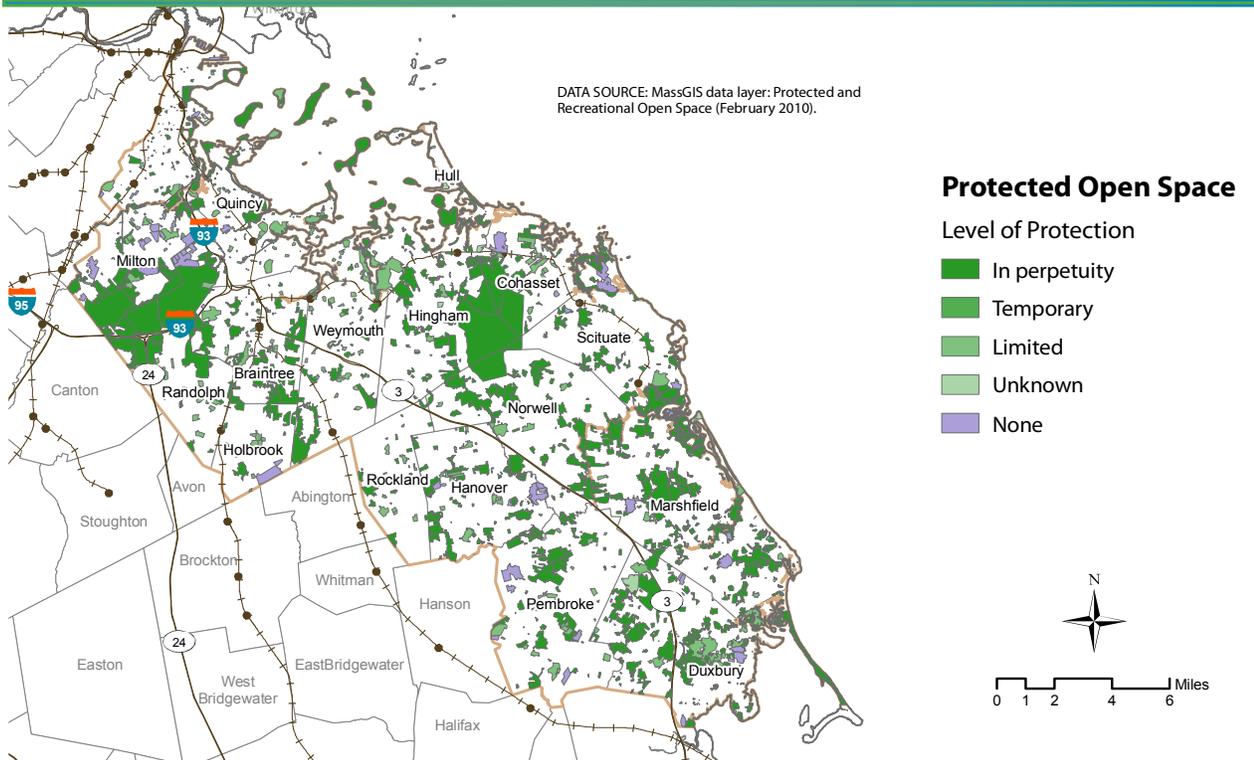
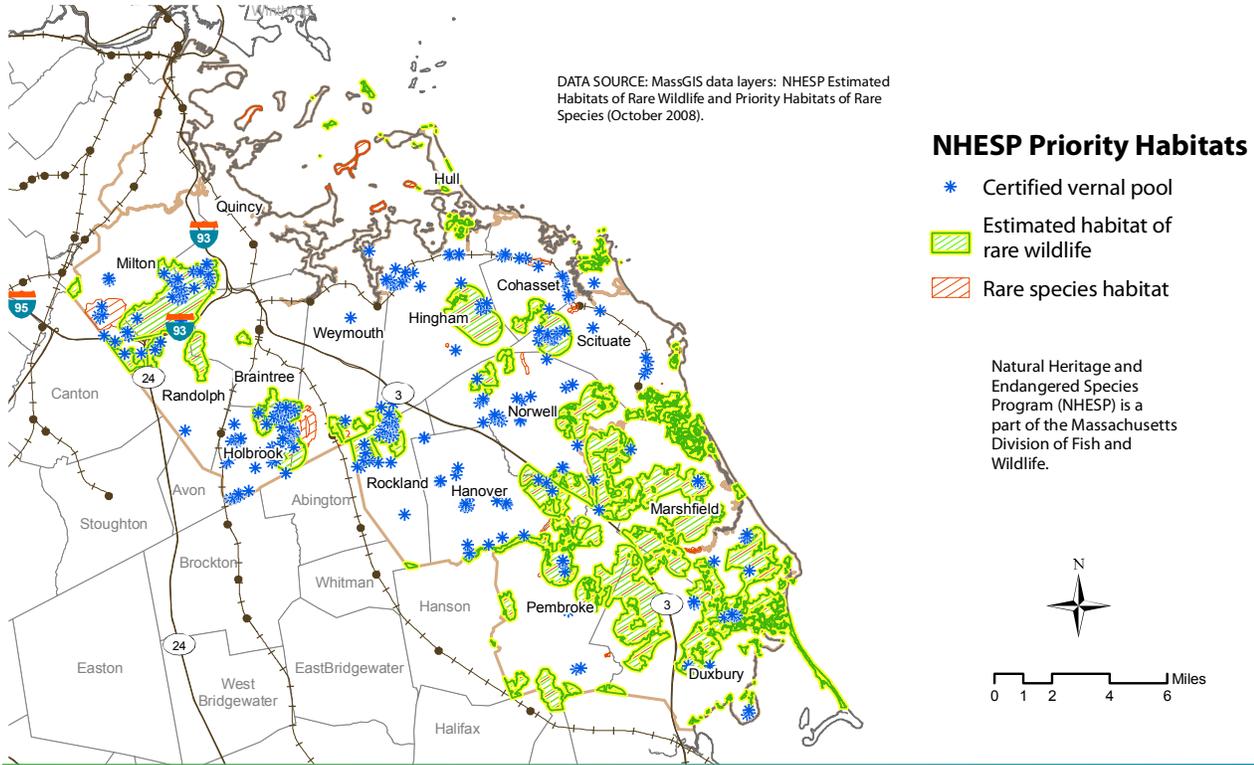


FIGURE 7-19

NHESP HABITATS/PROTECTED OPEN SPACE - SOUTHEAST





- 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 Southeast Corridor has five Areas of Critical Environmental Concern (ACEC):

- Cranberry Brook Watershed located in Braintree and Holbrook. The Cranberry Brook Watershed has 1,050 acres and was designated in 1983.
- Fowl Meadows and Ponkapoag Bog located in portions of Milton and Randolph has 8,350 acres and was designated in 1992
- Neponset River Estuary located In Boston, Milton, and Quincy. The Neponset River Estuary has 1,300 acres and was designated in 1995.
- Weir River located in in Cohasset, Hingham, and Hull. The Weir River has 950 acres and was designated in 1986.
- Weymouth Back River located in Hingham and Weymouth. The Weymouth Back River has 800 acres and was designated in 1982.

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 Southeast Corridor include parts of Dorchester, Mattapan, Quincy, and Randolph. MPO staff meet with social service and community contacts and conducts surveys to identify needs within these environmental justice areas. Table 7-21 outlines issues and needs and suggested responses identified by contacts in the environmental justice areas in the Southeast Corridor.

TABLE 7-21

IDENTIFIED TRANSPORTATION EQUITY ISSUES

COMMUNITY	REPORTED ISSUES	POSSIBLE SOLUTIONS*
Dorchester & Mattapan	Pedestrians and bicyclists need a safer environment and better infrastructure. Traffic calming and complete streets design principles would help. Traffic speeds are too fast on neighborhood streets.	
Dorchester	Kosciuszko Circle, near I-93 and Columbia Road, is dangerous.	
Dorchester	Better circumferential transit is needed to connect Dorchester with neighborhoods to the west.	
Dorchester	Many of the buses are crowded or operate at slow speeds. Fares are high.	
Dorchester	A connection between the Red Line and Blue Line is needed.	
Quincy	Bicycling infrastructure is lacking throughout the city and buses do not run frequently enough.	
Randolph	MBTA bus service and the Council on Aging van meet most resident's transportation needs. The only unmet need is for some medical appointments	Provide service for medical appointments.
Randolph	Existing bus routes do not serve some sections of Randolph.	Modify bus routes to serve neighborhoods that are not now served.

* 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 SOUTHEAST 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 the 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 Southeast Corridor needs assessment identifies bridge and roadway maintenance needs and significant bottleneck and crash locations. The identified needs and problems listed below will promote the realization of the vision:

- Of the 375 bridges in the Southeast Corridor, 72 (19%) are considered functionally obsolete (do not meet current traffic demands or highway standards), and 16 (4%) 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:
 - I-93 Southeast Expressway from the Braintree split to the I-90 interchange (Braintree, Quincy, Milton)
 - I-93/Rte. 1 from Ponkapoag to the I-93/Southeast Expressway/Braintree split (Milton, Braintree)
 - Route 3 from the Braintree split to Marshfield
 - Route 24 from Mazzeo Drive to I-93 ramps (Randolph)
 - Route 3A from the I-93/Southeast Expressway interchange to Hingham
 - Route 18 in Weymouth
 - Route 28 from the I-93/Route 1 interchange to Avon
 - Route 37 from the I-93 interchange to the intersection with Route 139
 - Route 203/Morton Street/Gallivan Boulevard from Route 28/Blue Hill Avenue to I-93
- The top crash locations in the Southeast 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:
 - Interstate 93 at Granite Street, Braintree (795)
 - Interstate 93 at Columbia Road, Boston (697)
 - Interstate 93 at Granite Avenue, Milton (615)
 - Route 3 at Route 18, Weymouth (489)
 - Interstate 93 near the ramps to Furnace Brook Parkway, Quincy (460)

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:

- Twelve bridges on the Fairmount Line are currently rated as structurally deficient. Work has commenced on some of these.
- On the Red Line, upgrades to portions of the track, power, and signal systems are needed and cars must be purchased so the 1969 fleet can be retired. The Cabot maintenance facility is in need of renovations.
- New vehicles are needed to replace the PCC cars on the Mattapan High Speed Line.
- The Cabot and Quincy bus garages need some repairs and upgrades.
- Transit reliability throughout the Southeast Corridor is poor. Only three of the 3 local bus routes (9%), and one (Fairmount) of four commuter rail lines, meet the MBTA's schedule adherence standards.
- Wollaston Station on the Red Line and Valley Road Station on the Mattapan High Speed Line are not ADA accessible.
- Three bus routes (19, 22, and 28) in the Southeast Corridor are predicted to have crowding levels in 2030 that would require additional service.
- One commuter rail station and four Red Line station park and ride lots in the corridor are utilized at greater than 85%.
- By 2030, ridership demand on the Middleborough/Lakeville Line is projected to exceed capacity if six-car trains are still in use then.
- Very densely populated areas in Boston served by MBTA bus Routes 23 and 28 do not have frequent rapid transit access within a reasonable walking distance.
- Capacity enhancements on the Old Colony Lines are limited by sections of single track.
- Higher density areas in parts of Weymouth, Randolph, and Rockand do not have direct access to transit services.

Issues to watch:

- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- By 2030, the largest growth in intratown trips is projected for Weymouth and Hingham, which currently have limited existing transit services and, therefore, very low transit mode shares.

Freight

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

- Route 24 at Interstate 93 and Interstate 93 southbound at Routes 3 and 128 (the Braintree Split) were identified in the MassDOT Freight Plan as among 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 dredged to 48 feet.
- Overweight truck routes serving the Port of Boston will improve the efficiency of freight operations.
- The Port of Boston lacks direct access to highway and rail facilities.
- The desired vertical clearance is not met by 79% of highway bridges nor by 79% of railroad bridges.

Issue to watch:

- As demand for rail freight increases, tracks carrying that freight in the Southeast Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.

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 Red Line or commuter rail stations.
- Few roads (approximately 2%) in the Southeast Corridor provide bicycle accommodations.
- About 58% of the non-interstate roads in the Southeast Corridor do not have a sidewalk on either side of the roadway.
- The Southeast Corridor lacks a bicycle corridor into Boston Proper. There are limited major bicycle connections for circumferential travel.

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:

- Traffic calming and complete streets design principles will create a safer environment for pedestrians and bicyclists.
- Better circumferential transit and a connection between the Red and Blue Lines are needed.

- Buses in parts of Dorchester are crowded and operate at slow speeds.
- Bicycling infrastructure is lacking throughout Quincy and buses do not run frequently enough.
- Parts of Randolph lack transit service.

Issue to watch:

- The elderly population is expected to grow substantially between now and 2035. Meeting their mobility needs will be an important issue to address during this time period.

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 Red Line and commuter rail lines. Transit capacity may need to increase in order to handle service demands.
- The largest developments planned in the corridor are SouthField (2 million square feet of commercial, office, and industrial space, and 3,800 housing units), and the Quincy Center redevelopment (1.3 million square feet of retail, office, and hotel uses, and 800 housing units). Other large projects include a 1,000-unit mixed use development at the Fore River Shipyard, and buildout of Enterprise Park in Marshfield.