

# The CMP Network

## BACKGROUND

Generally speaking, the Congestion Management Process is applied to the Boston Region MPO area. This region includes 101 cities and towns in eastern Massachusetts, within a radius of roughly 20 miles of the city of Boston. These municipalities are listed in Table 2-1.

In addition, in order to provide a comprehensive regional approach to congestion management, the CMP reaches beyond the MPO region for some types of monitoring. Several regionally significant roadways beyond the MPO boundary are included, as well as the entire MBTA commuter rail system. This section describes the CMP area of application in detail (Figure 2-1) in terms of the various transportation facilities that are monitored.

## ROADWAY NETWORK

The CMP roadway network includes all roadways in the Boston region that are functionally classified as principal (major) arterials and all limited-access highways (often called expressways or freeways), as well as some minor arterials. This network comprises about 900 centerline miles (or 1,800 miles, bidirectional) of arterial roadways and 377 centerline miles of limited-access highways—more than 10% of all roadways in the region, and about 50% of the Federal-Aid Highway System. Most state-numbered roadways are included in the monitored network, as are most corridors of the National Highway System. In general, the volumes on these roadways exceed 10,000 vehicles per day. Most of the arterial roadways typically handle over 27,500 vehicles per day on some portion of their length.

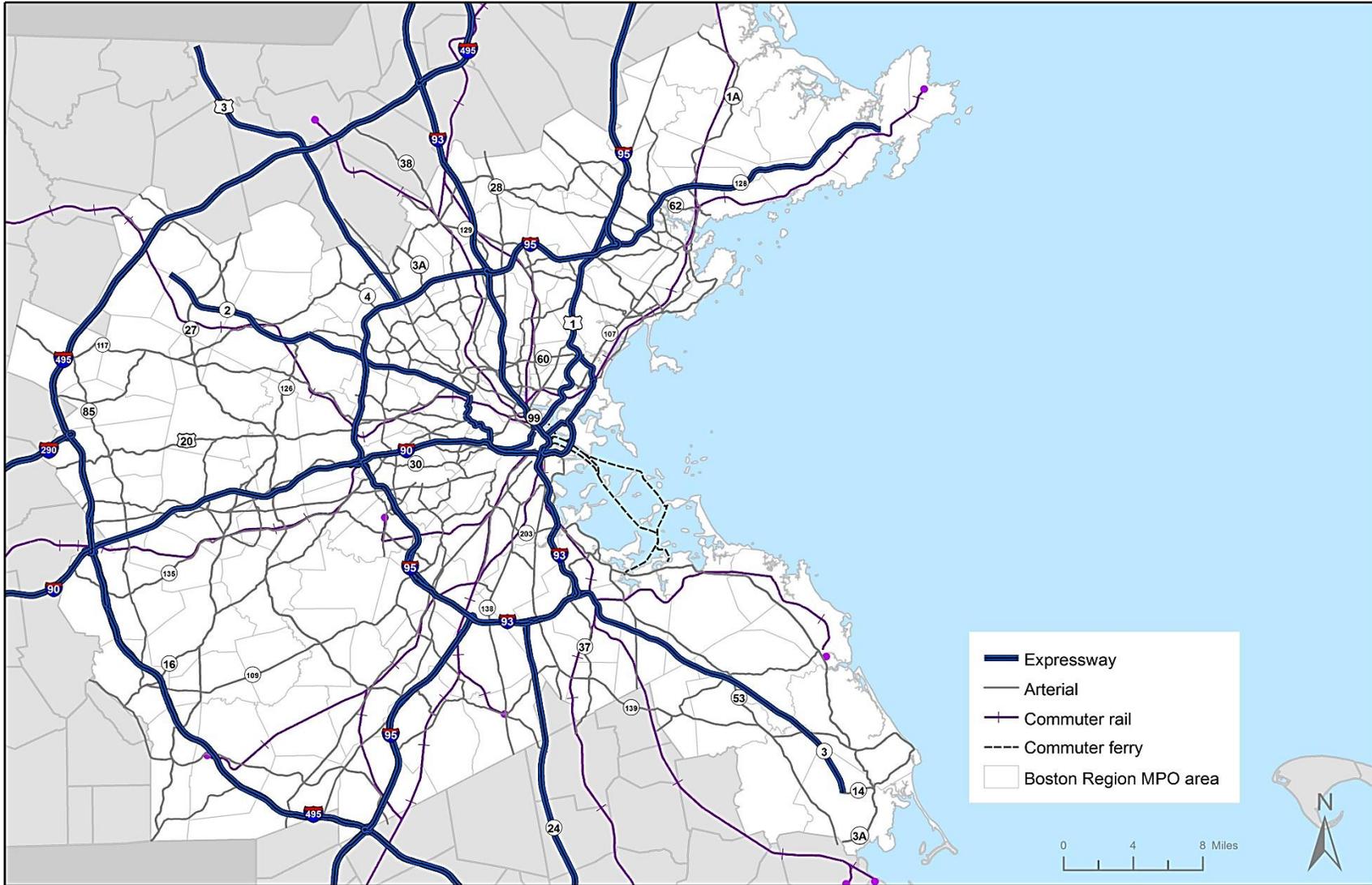
Volumes on the limited-access highways in the Boston region typically range from 40,000 to 235,000 vehicles per day. The CMP network is dynamic, meaning that any given monitoring effort may include additional roads; conversely, not all roadways are monitored in all monitoring efforts.

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The CMP roadway network goes beyond the boundary of the Boston Region MPO area to include most of the limited-access highways and major arterials within I-495. The network is illustrated in Figure 2-2.

**TABLE 2-1  
Boston Region MPO Cities and Towns**

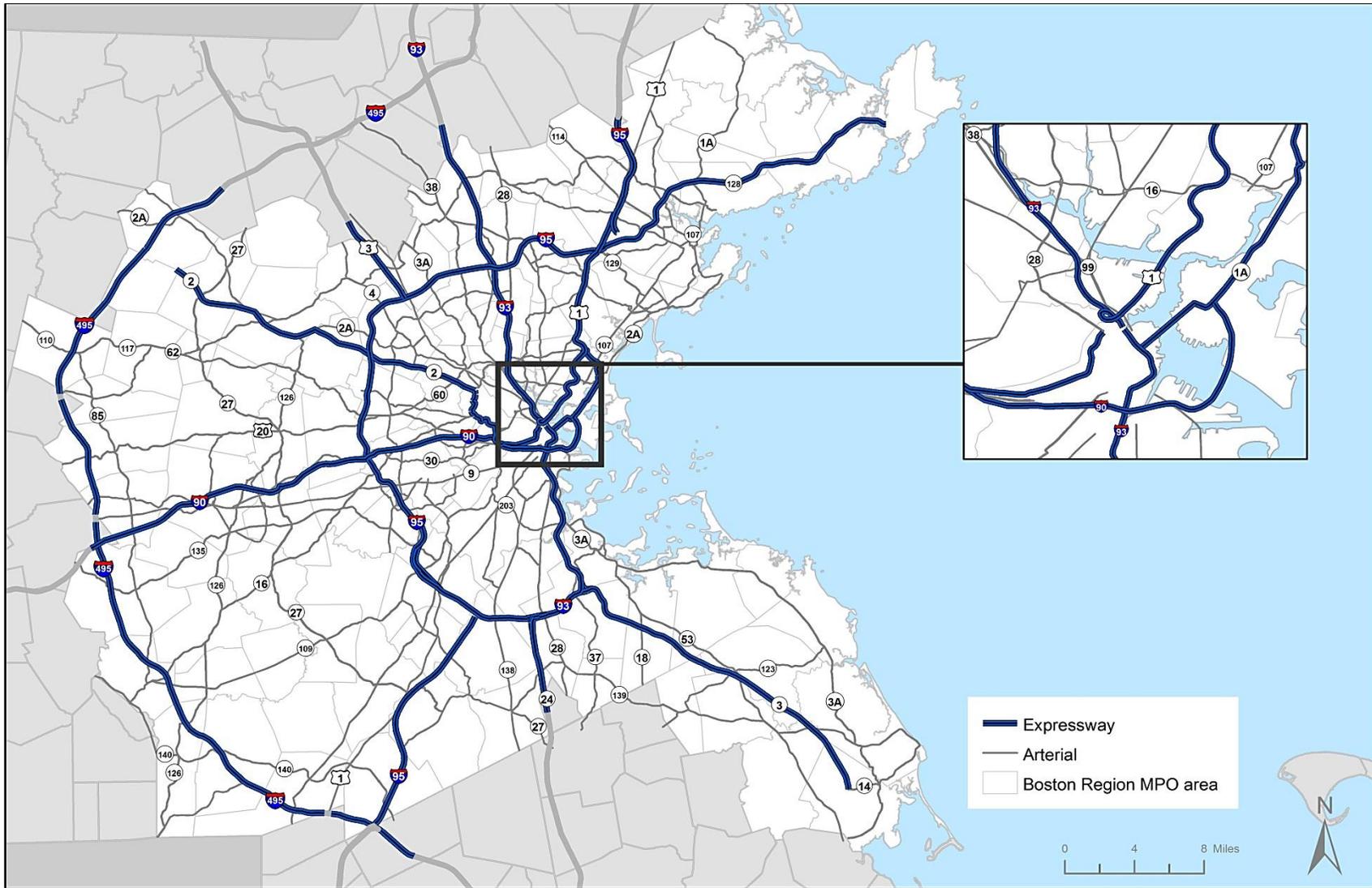
| <b>City</b> | <b>Town</b> |               |              |
|-------------|-------------|---------------|--------------|
| Beverly     | Acton       | Holbrook      | Pembroke     |
| Boston      | Arlington   | Holliston     | Randolph     |
| Cambridge   | Ashland     | Hopkinton     | Rockland     |
| Chelsea     | Bedford     | Hudson        | Rockport     |
| Everett     | Bellingham  | Hull          | Saugus       |
| Gloucester  | Belmont     | Ipswich       | Scituate     |
| Lexington   | Bolton      | Lincoln       | Sharon       |
| Lynn        | Boxborough  | Littleton     | Sherborn     |
| Malden      | Braintree   | Lynnfield     | Southborough |
| Marlborough | Brookline   | Manchester    | Stoughton    |
| Medford     | Burlington  | Marblehead    | Stow         |
| Melrose     | Canton      | Marshfield    | Sudbury      |
| Newton      | Carlisle    | Maynard       | Swampscott   |
| Peabody     | Cohasset    | Medfield      | Topsfield    |
| Quincy      | Concord     | Medway        | Wakefield    |
| Reading     | Danvers     | Middleton     | Walpole      |
| Revere      | Dedham      | Milford       | Wayland      |
| Salem       | Dover       | Millis        | Wenham       |
| Somerville  | Duxbury     | Milton        | Weston       |
| Stoneham    | Essex       | Nahant        | Westwood     |
| Waltham     | Foxborough  | Natick        | Weymouth     |
| Watertown   | Framingham  | Needham       | Wilmington   |
| Wellesley   | Franklin    | Norfolk       | Winchester   |
| Woburn      | Hamilton    | North Reading | Winthrop     |
|             | Hanover     | Norwell       | Wrentham     |
|             | Hingham     | Norwood       |              |



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FIGURE 2-1  
CMP Area of Application  
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FIGURE 2-2  
CMP-Monitored Roadway Network  
2012

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## HIGH-OCCUPANCY-VEHICLE (HOV) LANES

Two HOV lanes operate on the CMP network,<sup>1</sup> both on Interstate 93. The I-93 North HOV lane, north of downtown Boston, operates in the inbound direction (toward Boston) in the mornings; the Southeast Expressway HOV lane, south of downtown Boston, operates in the inbound direction in the mornings and in the outbound direction in the afternoons. The HOV lanes are illustrated in Figure 2-3.

The I-93 North HOV lane is a southbound, buffer-separated lane that currently operates between 6:00 AM and 10:00 AM, Monday through Friday. It extends 2.6 miles from a point 0.3 mile south of Exit 31 (Mystic Avenue) in Somerville to 0.2 mile south of the Route 1 merge on the Leonard P. Zakim Bunker Hill Memorial Bridge over the Charles River. During its times of operation, this HOV lane is open to vehicles with two or more occupants and to all motorcycles. The lane is open to all traffic at all other times.

The I-93 Southeast Expressway HOV lane is a reversible, barrier-separated “zipper” lane that currently operates between 6:00 AM and 10:00 AM in the northbound direction and between 3:00 PM and 7:00 PM in the southbound direction, Monday through Friday. Specialized machinery is used to move the barriers into place each weekday. The lane extends 5.5 miles from a point 0.24 mile north of the merge of I-93 and Route 3 merge in Quincy to a point 0.9 miles south of Columbia Road in Dorchester. The lane’s contraflow system “borrows” one of the general-purpose lanes in the off-peak direction and converts it to a peak-direction HOV lane that is open to carpools (cars with two or more occupants), vanpools, buses, and motorcycles. The HOV facilities on the Massachusetts Turnpike (I-90) are not monitored by MPO staff.

## PUBLIC TRANSIT

Public transit in the area monitored by the CMP is provided by the Massachusetts Bay Transportation Authority (MBTA). The MetroWest Regional Transit Authority (MWRTA) and Cape Anne Transit Authority (CATA) and several other providers of local, intra-town services, as well as express commuter service exist within the area monitored by the CMP, even though they are not monitored by the CMP. The commuter rail system consists of 14 lines that provide regular service to 133 stations. The rapid transit system consists of three heavy rail lines (the Blue, Orange, and Red Lines), the Green Line with its four branches (B, C, D, and E), and the Mattapan High-Speed Line, serving a total of 135 stops.<sup>2</sup> The MBTA bus system consists of 187 bus routes, including local routes,

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<sup>1</sup> Three HOV lanes operate in the region’s network; the CMP monitors two, the subject of this section. The Central Artery/Tunnel (CA/T) HOV lanes which were constructed as part of the CA/T are not monitored by the CMP.

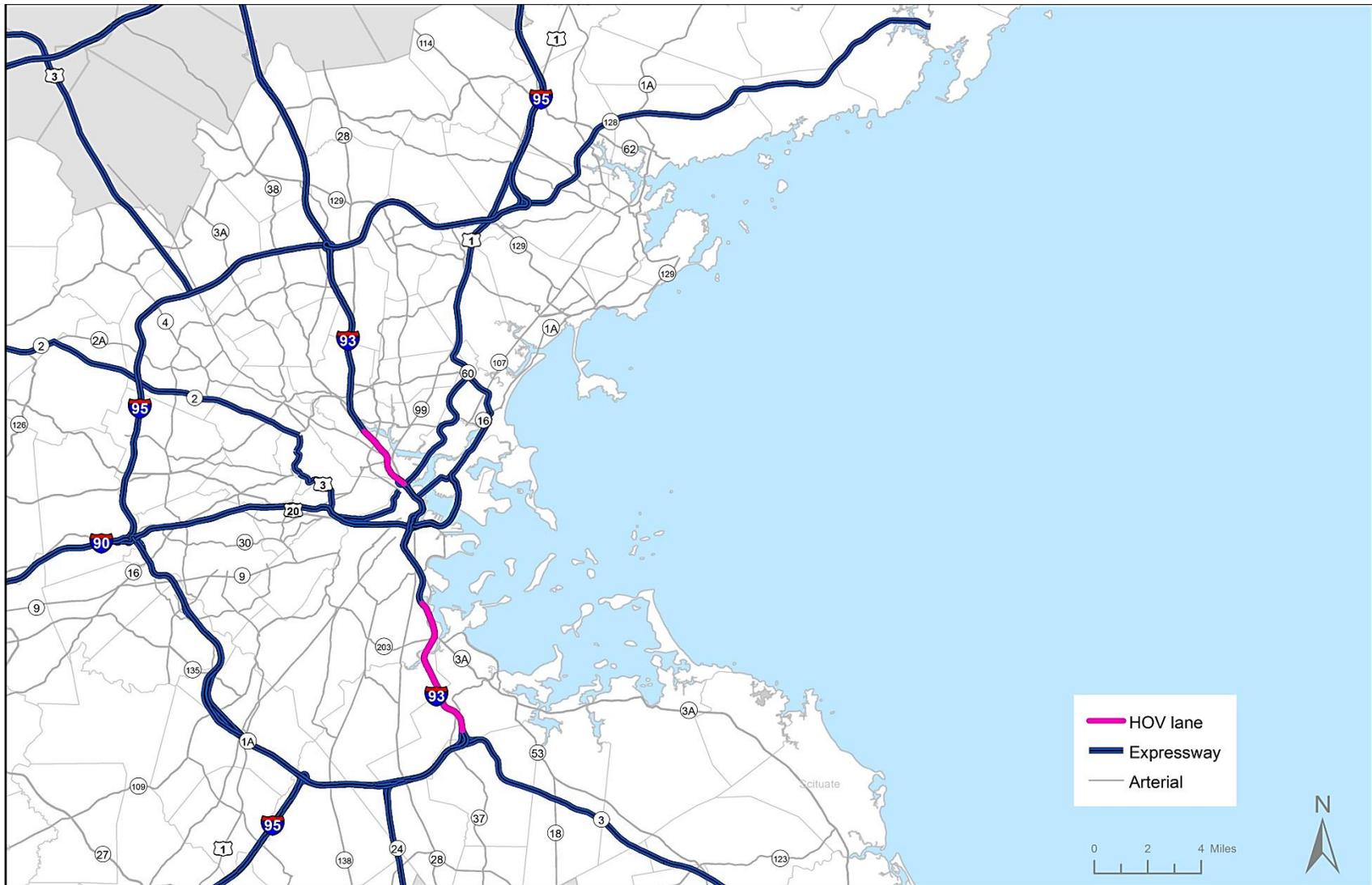
<sup>2</sup> MBTA, “Subway Map.” Available online at [http://www.mbta.com/schedules\\_and\\_maps/subway/](http://www.mbta.com/schedules_and_maps/subway/) (accessed June 5, 2012).

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inner express routes, outer express routes, “trackless trolley” routes powered by overhead electric wires, and four bus rapid transit routes (the four branches of the Silver Line). The commuter boat system consists of three routes, including the Inner Harbor Ferry. The public transit network, excluding the bus route network, is illustrated in Figure 2-4. The vehicle-miles traveled per capita in relation to this network are illustrated in Figure 2-5. It is interesting to note that this measure roughly varies inversely with distance from the core. The CMP does not collect monitoring data for any MBTA services except park-and-ride lots because extensive monitoring and evaluations are done by the Service Planning Department of the MBTA, especially for buses. In addition, the CTPS Transit Service Planning staff performs monitoring and evaluation functions through contracts with MassDOT and the MBTA. The CMP staff often gathers data from the MBTA for monitoring bus schedule adherence and seating capacity.<sup>3</sup>

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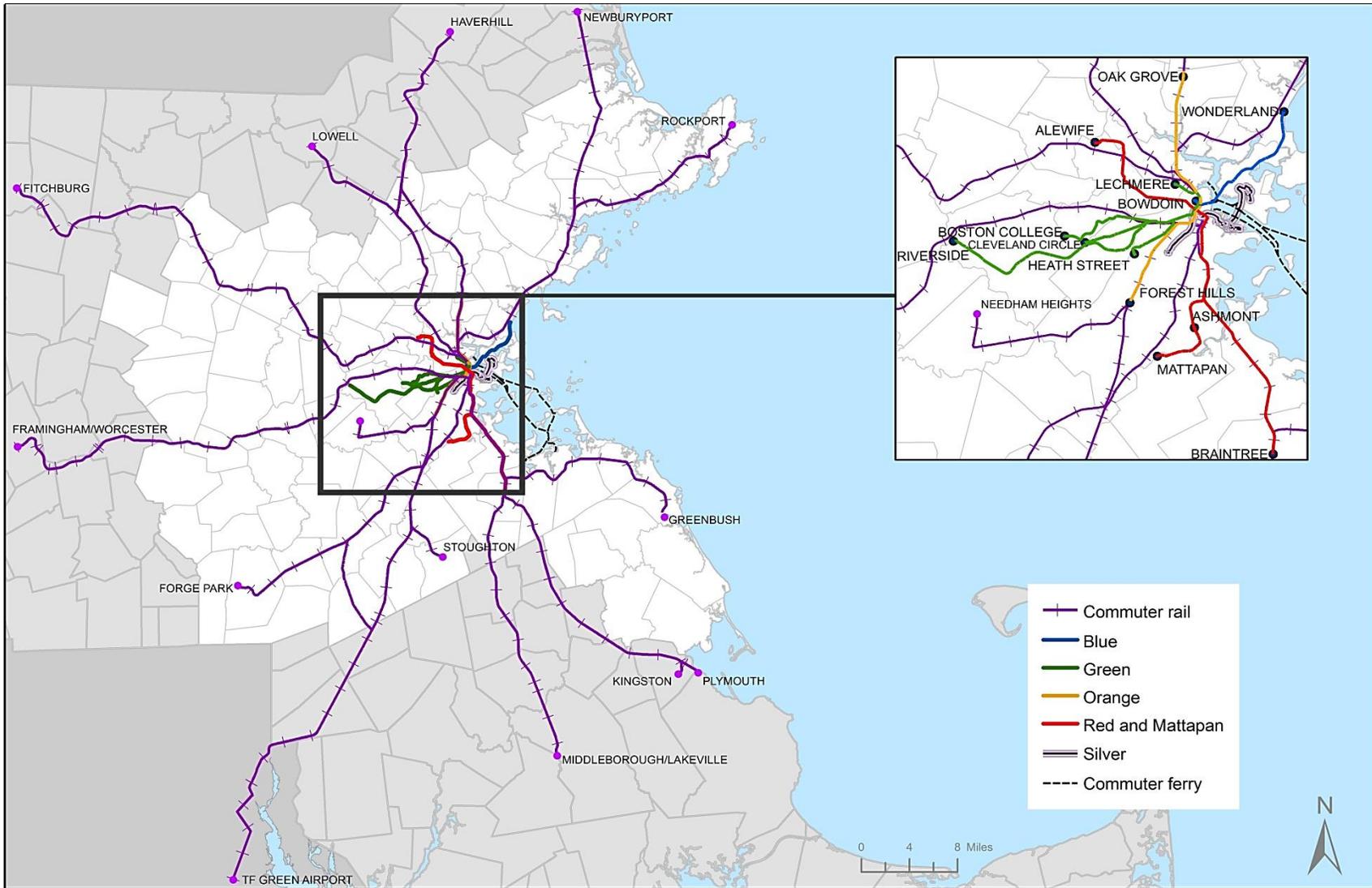
3 The MBTA uses passenger load adherence as a performance measure to measure seating capacity instead of passenger crowding, which is the Boston Region Metropolitan Planning Organization’s performance measure.



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FIGURE 2-3  
CMP-Monitored HOV Facilities  
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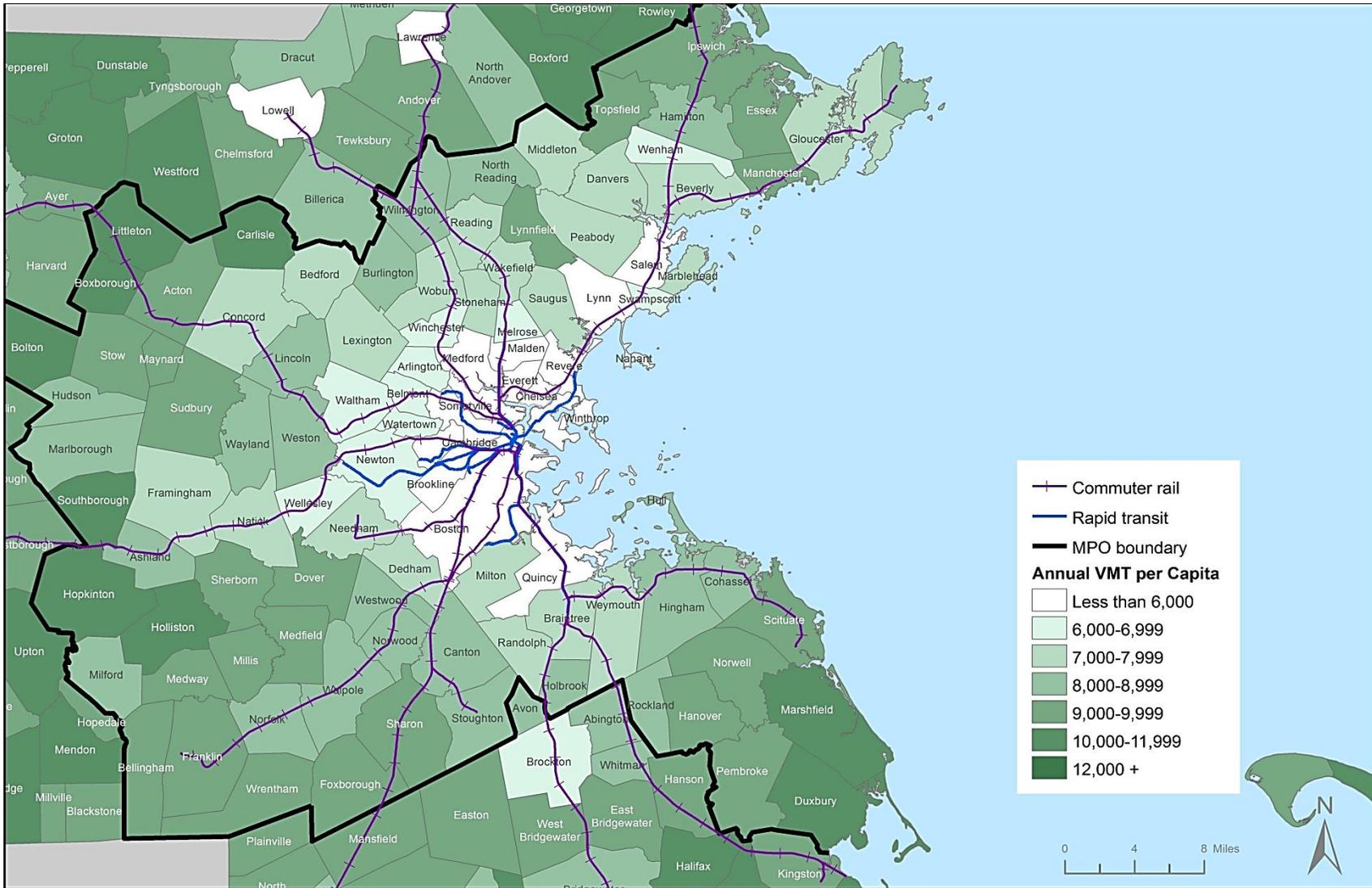
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FIGURE 2-4  
Public Transit Network (Excludes Local Bus Network)  
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**FIGURE 2-5**  
**Vehicle-Miles Traveled per Capita**  
**2005-07**

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## **PARK-AND-RIDE LOTS**

The CMP monitors park-and-ride facilities at MBTA stations and MassDOT lots. Bicycle parking is also monitored. Within the MBTA system, according to the most recent inventory, automobile parking is available at 114 commuter rail stations, 28 rapid transit stations, three boat terminals, and one express bus origin location. Bicycle parking facilities are also available at most of these stations.

The most recent inventory, conducted between January 2009 and August 2010, indicated that a combined 58% of parking spaces at all stations for all modes in the MBTA system were used on a typical weekday morning. The breakdown by type of service was 56% utilization for the commuter rail system, 61% utilization for the rapid transit system, 93% utilization for express bus lots, and 69% utilization for commuter boat lots. This report includes an overview of the results of MBTA park-and-ride lot monitoring (see the Problem and Needs section for details).

In addition to MBTA lots, the CMP monitors MassDOT-operated park-and-ride lots, which are designed to encourage carpooling and vanpooling. The data collection for these lots is currently performed by MassDOT. For an overview of the results of this data collection, see the Problem and Needs section .

## **BICYCLE FACILITIES**

Fewer than 2% of roadway centerline miles throughout the Boston Region MPO area have bicycle-specific accommodations, such as bike lanes.<sup>4</sup> Bicycles are allowed on all roads except limited-access highways. The Boston region network of bicycle-specific facilities includes on-street bike lanes, separate shared-use paths, and roadway lanes marked with sharrows, which are shared-lane markings indicating that motor vehicles need to share that section of roadway. There are also some lanes that are restricted to buses and some that are restricted to bicycles. In addition, less experienced and younger bicyclists may ride on some sidewalks (though this is generally prohibited in central business districts). There are also innovative bicycle facility designs in the region, such as the barrier-separated bike lanes (cycle tracks) on Vassar Street in Cambridge.

Facilities for linking bicycle travel to transit include bicycle parking at transit stations (for a full discussion of this, see the Bicycle and Pedestrian Facilities subsection of System Monitoring), bike racks on buses, and the option of transporting bicycles on trains at certain times. Most rapid transit and commuter rail stations now have bike racks, and two rapid transit stations (Alewife and Forest Hills) have secure keycard-access bicycle parking. Buses on 72 MBTA bus routes now have bicycle racks. Each bus can carry two

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<sup>4</sup> Boston Region MPO Long-Range Transportation Plan, Volume II (Needs Assessment), endorsed by the Boston Region MPO on September 22, 2011.

bicycles. Outside of peak commuting hours, bikes can be taken on heavy rail rapid transit trains (the Blue, Red, and Orange lines) and commuter trains.<sup>5</sup> Bicycle cages are currently located at three MBTA stations, including Alewife (232 spaces), Forest Hills (80 spaces), and South Station (64 spaces).

The Hubway system is a newly implemented bike-sharing system in the metro region that was launched in July 2011. There are currently over 60 stations operating, with over 600 bicycles available, and there are plans to add more stations soon. It is a convenient service for casual bicyclists because bicycles can be rented for half-hour increments and returned at any station.

## **PEDESTRIAN FACILITIES**

According to the U.S. Census Bureau's 2006–10 estimates, more than 101,400 residents of the Boston Region MPO area walk to work, constituting just over a 6% mode share for all commuters. In addition, walking is the mode used for approximately half of all trips to MBTA rapid transit stations.

Regionwide, only 50% of non-interstate roadway centerline miles have sidewalks. Within the MPO region, this varies from 85% in the Central Corridor to 41% in the Southeast Corridor,<sup>6</sup> as defined by the FFY 2011 LRTP Needs Assessment.<sup>7</sup> Multi-use paths (for bicycling and other nonmotorized uses) are another important component of the pedestrian transportation network.

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<sup>5</sup> MBTA, "Bikes and the T." Available online the MBTA's website, [www.mbta.com](http://www.mbta.com) (accessed June 15, 2011).

<sup>6</sup> Southeast Corridor – Interstate 93, Routes 3 and 24, the Middleborough/Lakeville, Kingston/Plymouth, and Greenbush lines of the commuter rail system, and the Red Line of the rapid transit system.

<sup>7</sup> Boston Region MPO Long-Range Transportation Plan, Volume II (Needs Assessment), endorsed by the Boston Region MPO on September 22, 2011.