



## BACKGROUND

This chapter lists and outlines the recommended projects and programs that represent the Boston Region MPO's priorities through the year 2035. It explains the process used to select these projects for the region and the transportation model results that forecast their overall impacts.

The MPO recognizes the diversity of transportation needs and issues throughout the Boston region and attempts to respond to them in a balanced manner. The MPO set the policies, selected the regionally significant and major infrastructure projects, and identified actions necessary to serve all modes of transportation for persons and freight in this region. In doing so, they attempted to address the issues of system preservation, safety, mobility, congestion, and sprawl while supporting economic vitality and environmental justice.

The region's infrastructure is aging and it has become clear that the demands placed on highway and transit facilities have been taxing to the point that routine maintenance is insufficient to keep up with maintenance needs. As a result, there is a significant backlog of maintenance and state-of-good-repair work to be done on the highway and transit system, including bridges, roadway pavement, transit rolling stock, and traffic and transit control equipment. Under these circumstances, the MPO recognizes that the concept of preservation, modernization, and efficiency has become ever more important. Attention to the maintenance needs must be applied within a system of priority setting that addresses both the most serious problems and the most effective investments in order to provide maximum current and future benefits.

There is also a need to support a transportation system that expands choices for travel within the region. While advocating for a transportation system that adequately supports all modes of travel, the MPO recognizes that many people in the region are, and will continue to be, reliant on the automobile. The members of the MPO expect both the roadway

congestion to worsen and the demand for transit to increase in the future, and recognize that many possibilities exist to reduce our dependence on the single-occupant vehicle.

The Boston Region MPO recognizes that climate change will likely have significant impacts on the Boston region if climate trends continue as projected. In order to minimize the negative impacts, the MPO seeks to take steps to decrease our carbon footprint and to simultaneously adapt our transportation system to minimize damage. The MPO strongly considers projects and strategies that protect and enhance the environment, promote energy conservation, and improve the quality of life in the region. Transportation investments also support livability by providing residents of the region with convenient access to opportunities and resources. Affordable housing, access to services, employment opportunities, and shopping in close proximity all contribute to the livability of a community, as do safe, affordable, and healthy options for getting around.

The MPO seeks to provide access to transportation services on an equitable basis across the region.

The MPO seeks to provide access to transportation services on an equitable basis across the region. This includes, but is not limited to, providing transportation options for low-income and minority communities for travel to jobs, services, and other important destinations.

Finally, the MPO recognizes that the transportation system plays a critical role in the continued economic health of the region. Many sectors of the regional economy depend heavily on the safe and efficient movement of goods and services by truck, rail, air, and water.

## PROJECT SELECTION

Chapter 1, Introduction and Plan Process, describes the full MPO process used in selecting the recommended set of projects and programs included in this long-range transportation plan (LRTP). Given the fiscal constraint requirement of the LRTP, the Boston Region MPO had to identify the region's top priority projects as candidates for funding. The final selection of highway and transit projects was based on the informed judgment of MPO members after they reviewed many sources of information, including:

- Conclusions from the Regional Needs Assessment (Volume II of the LRTP)
- Results from the regional travel demand model
- Information available on projects through feasibility studies, project-specific modeling work, and environmental impact reports
- A matrix examining each individual highway and transit project for conformity with the MPO's transportation policies and recommendations and prioritizations of transit projects as set forth in the MBTA's Program for Mass Transportation
- Recommendations from the Regional Transportation Advisory Council, the MPO's advisory group
- MPO members' knowledge of proposed projects
- Feedback from the public through the MPO's outreach process

The Boston Region MPO recognized the diversity of transportation needs and issues in the region as identified through the Regional Needs Assessment. With the needs in mind, the MPO considered three separate strategies for investments (described in

Chapter 1). These strategies provided various scenarios for sharing the region’s financial resources among maintenance and state-of-good-repair, modernization, expansion, traffic management and operations, and other projects or programs. The MPO’s discussions involved weighing and balancing many difficult and sometimes conflicting issues. These included the limited available funding, prior funding commitments from the previous LRTP, the backlog of maintenance projects, demand for modernization and safety improvements, new initiatives such as livability, and the high cost of addressing regional needs. The MPO also sought to fund projects across transportation modes to support a transportation system that expands travel options within the region.

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Given the funding constraints, maintenance challenges, and capacity issues, there was consensus that no additional regionally significant projects should be selected in the new LRTP and that the LRTP should honor its previous project commitments. The MPO therefore decided to approve a slightly modified version of the “Current Approach” strategy. This decision allows the MPO to continue to fund prior commitments, achieve a modal split among roadways, strategic transit, bicycle and pedestrian projects, and to leave approximately 41 percent of LRTP funds unassigned to fund lower-cost, non-regionally significant projects addressing other maintenance, modernization, safety, operations, and efficiency needs in the region through the Transportation Improvement Program (TIP). The set of projects and programs selected allocates funds by the following investment categories:

- Roadway Modernization – 45 percent
- Roadway Expansion – 42 percent
- Transit Expansion – 8 percent
- Bicycle/Pedestrian Expansion – 2 percent
- Clean Air and Mobility Program – 3 percent

This set of projects and programs addresses a variety of transportation needs and issues, including highway interchanges, corridor improvements, regional rail trails, and extension of light rail transit service, and is generally consistent with MetroFuture, the land use plan for the Boston region, and with the sustainable-development principles of the Commonwealth.

## **RECOMMENDED LIST OF PLANNED MAJOR INFRASTRUCTURE AND EXPANSION PROJECTS**

This LRTP includes funding for both maintenance and expansion of the transportation system. Funding for much of the maintenance of the roadways for the Boston Region MPO area is provided through the statewide resurfacing, maintenance, and infrastructure programs. Maintenance of the bridges is provided through the statewide bridge program and the Accelerated Bridge Program.

In the Boston region, the highway network’s major infrastructure and capacity expansion projects and other maintenance and rehabilitation projects not included in the statewide programs are funded through the Boston Region MPO’s share of the Discretionary Capital Program and the Regional Infrastructure Program. In this LRTP, for the transit

The MPO has allocated all of the MBTA's future transit capital funding to system infrastructure maintenance, accessibility improvements, and system enhancements.

network, the MPO has allocated all of the MBTA's future transit capital funding to system infrastructure maintenance, accessibility improvements, and system enhancements. It also demonstrates the MPO's commitment to the State Implementation Plan (SIP) projects by programming and funding those new projects. The Commonwealth has made a commitment to fund the SIP commitment transit projects.

The major infrastructure and capacity expansion program is used to fund projects currently underway and also projects that fall into the definition of a major infrastructure or expansion project. A major infrastructure project is any project that costs over \$10 million. An expansion project is any project that adds capacity to the existing system through the addition of a travel lane, the construction of an interchange, the construction of an extension of a commuter rail or rapid transit line, or the procurement of additional (not replacement) public transportation vehicles.

The following ongoing No-Build major infrastructure and expansion projects are funded in this LRTP:

- The Central Artery Tunnel project: The total budget for this project is approximately \$14.625 billion, and the costs funded are \$686 million for the repayment of Grant Anticipation Notes.
- The Accelerated Bridge Program: This program repairs structurally deficient bridges across the Commonwealth. The total budget for this project is approximately \$3 billion, and the costs funded are \$1.108 billion for the repayment of Grant Anticipation Notes.
- Route 128 Additional Lanes (Randolph to Wellesley): The total budget for this project is approximately \$381.4 million, and the remaining costs funded are \$168 million. The completion date of this project is projected to be 2016.
- Crosby's Corner: The total budget for this project is \$65 million, all of which is funded in this LRTP.
- Fairmount Line Improvements: This is a State Implementation Plan project. The Commonwealth committed \$125 million for this project. The remaining cost, funded under this LRTP, is \$54.1 million. The completion date is projected to be the end of calendar year 2013.
- 1000 Additional Park-and-Ride Spaces: This is a State Implementation Plan project. The Commonwealth has committed to fund this project. The remaining cost funded under this LRTP, is \$32 million. The completion date is projected to be the spring of 2012.

After accounting for the costs of these ongoing projects, the remaining funds are available for major infrastructure and capacity expansion or set aside for low-cost, non-capacity-adding projects that advance the MPO's visions and policies. Table 8-1 lists the projects funded under the major infrastructure and capacity expansion program, the current cost, and the type of project—major infrastructure project, or expansion project, or both. Figure 8-1 shows the locations of these projects.

As shown in Table 8-1, the Recommended Plan allocates the majority of highway funding for highway projects. However, it also provides for flexing \$185 million in

**TABLE 8-1**

**MAJOR INFRASTRUCTURE AND EXPANSION PROJECTS IN THE RECOMMENDED PLAN**

PROJECT	INVESTMENT CATEGORY*	CURRENT COST
Middlesex Turnpike (Bedford, Burlington, & Billerica)	Expansion - Roadway	\$20,800,000
Trapelo Road (Belmont)	Modernization - Roadway	\$14,592,000
Additional Parking Spaces (Beverly & Salem)	Expansion - Transit	\$50,000,000
Conley Haul Road (Boston) **	Expansion - Roadway	\$25,000,000
Red Line–Blue Line Connector – Design Only (Boston)***	Expansion - Transit	\$49,000,000
Russia Wharf Ferry Terminal (Boston)	Expansion - Transit	\$2,200,000
Sullivan Square/Rutherford Avenue (Boston) ****	Modernization - Roadway	\$71,000,000
Braintree Split – I-93/Route 3 Interchange (Braintree)	Modernization /Expansion - Roadway	\$36,000,000
I-93/I-95 Interchange (Canton)	Modernization /Expansion - Roadway	\$235,500,000
I-95 (NB)/Dedham Street Ramp/Dedham Street Corridor (Canton)	Expansion - Roadway	\$35,000,000
Route 126/135 Grade Separation (Framingham)	Modernization - Roadway	\$58,500,000
Bruce Freeman Rail Trail (Concord to Westford)	Expansion - Bike/Ped	\$18,700,000
Route 53 Final Phase (Hanover)	Expansion - Roadway	\$1,000,000
Assabet River Rail Trail (Hudson to Acton)	Expansion - Bike/Ped	\$18,100,000
Route 1 Improvements (Malden, Revere, & Saugus)	Expansion - Roadway	\$175,196,000
Needham Street/Highland Avenue (Newton & Needham)	Modernization - Roadway	\$18,400,000
I-93/I-95 Interchange (Reading & Woburn)	Modernization /Expansion - Roadway	\$276,000,000
Clean Air Mobility Program (Regionwide)	Clean Air and Mobility	\$2,000,000/ yr
Bridge Street (Salem)	Expansion - Roadway	\$11,223,250
Green Line Lechmere to Medford Hillside (College Avenue)/ Union Square (Somerville)	Expansion - Transit	\$1,120,000,000
Green Line Extension from Medford Hillside (College Avenue) to Mystic Valley Parkway (Route 16) (Somerville & Medford)	Expansion - Transit	\$140,608,000
Route 18 Capacity Improvements (Weymouth) ****	Expansion - Roadway	\$31,350,000
Montvale Avenue (Woburn)	Expansion - Roadway	\$3,700,000
New Boston Street Bridge (Woburn)	Expansion - Roadway	\$4,900,000

\* Expansion – Project extends or adds capacity to the existing system,

Modernization – Upgrades to the existing system to meet contemporary standards and accommodate all users,

Clean Air and Mobility – Projects and programs funded through the Clean Air and Mobility Program

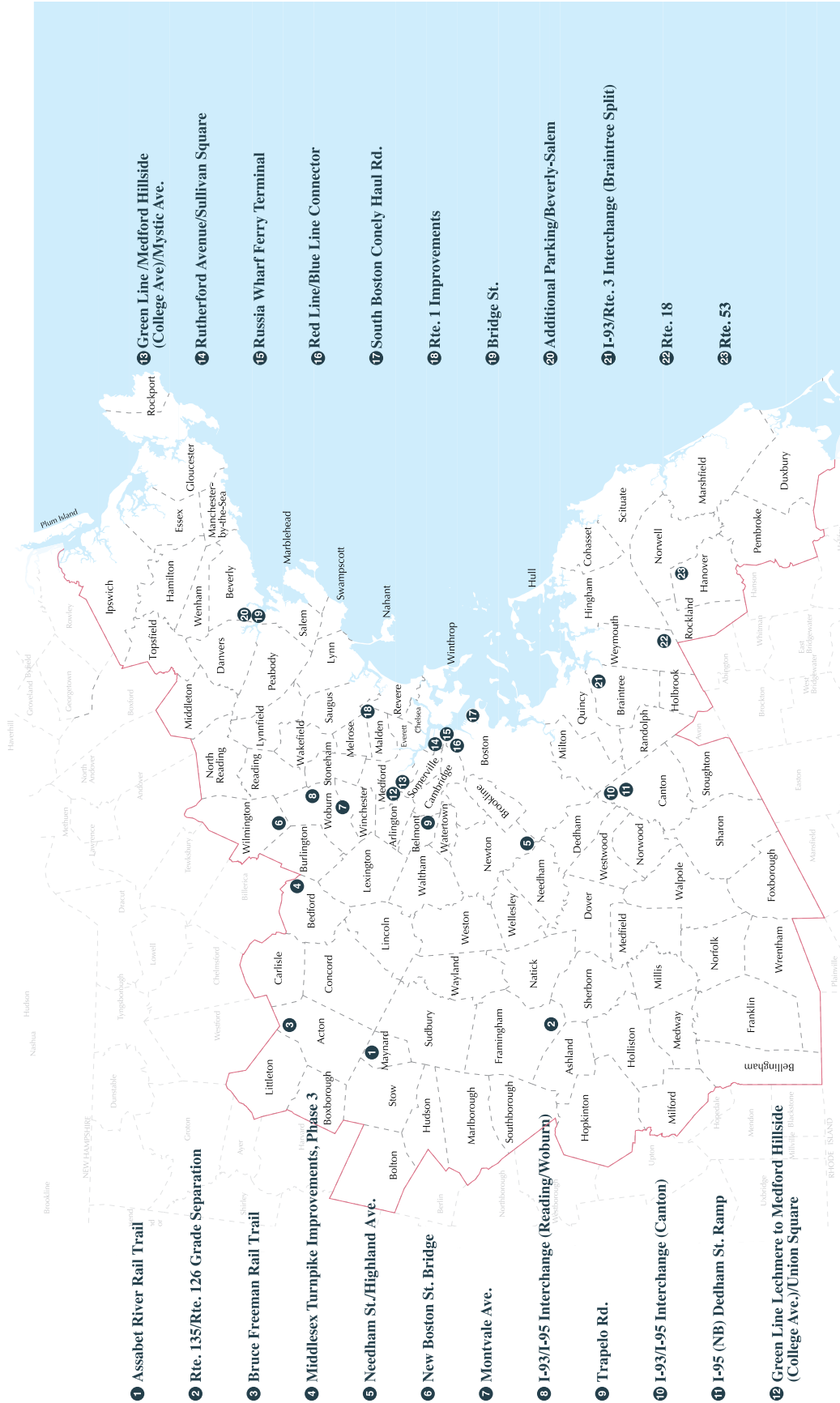
\*\* Non-MPO Funding will be used to fund the Conley Haul Road (Boston). This project will be paid for by the Massachusetts Port Authority.

\*\*\* MassDOT made a formal request on August 1, 2011, to remove this project from the State Implementation Plan regulation. The MPO is continuing to carry this cost until this process is completed.

\*\*\*\* A portion of these projects are funded with earmarks.

FIGURE 8-1

MAJOR INFRASTRUCTURE AND EXPANSION PROJECTS IN THE RECOMMENDED PLAN



highway funding to one transit project. All of the public transportation funds are used for improvements to the regional public transportation system. Based upon this distinction, the major expansion projects total approximately \$1.02 billion for non–Central Artery highway projects from the Boston Region MPO’s Discretionary Capital Program. The MPO also included funding for approximately \$1.042 billion in roadway modernization projects and programs. Table 8-2 shows the total amount of funding dedicated to major infrastructure and capacity expansion projects in this LRTP.

In addition to the major infrastructure and expansion projects listed in Table 8-1, the MPO is committed to continued funding of projects to improve mobility in the region, particularly in the following areas (see Chapters 4 and 5 for more details on these programs):

- Freight movement
- Suburban mobility/transportation demand management
- Bicycle facilities
- Pedestrian facilities
- Congestion Mitigation and Air Quality (CMAQ) Program, including the MPO’s Clean Air and Mobility Program

**TABLE 8-2**

**FUNDING DEDICATED TO MAJOR INFRASTRUCTURE AND EXPANSION PROJECTS**

PROJECT	DEDICATED FUNDING
Central Artery/Tunnel Project	\$685,675,000
Accelerated Bridge Program	\$1,108,000,000
MPO Discretionary Capital Program: Non–Artery Highway Projects (Major Infrastructure/Expansion Program)	\$1,025,698,000
MPO Discretionary Capital Program: Highway Funds Flexed to Transit (Major Infrastructure/Expansion Program)	\$185,031,000
MPO Discretionary Capital Program: Non–Artery Highway Projects (Roadway Modernization Program)	\$1,042,072,000
MPO Discretionary Capital Program: Non–Artery Highway Projects (Clean Air and Mobility Program)	\$58,528,000
MPO Discretionary Capital Program: Non–Artery Highway Projects (Unassigned Funds)	\$1,573,405,000
<b>HIGHWAY FUNDING SUBTOTAL</b>	<b>\$5,678,409,000</b>
Transit expansion projects funded in the Boston MPO by the Commonwealth	\$1,307,300,000
<b>TRANSIT FUNDING SUBTOTAL</b>	<b>\$1,307,300,000</b>

**HIGHWAY PROJECTS IN THE RECOMMENDED PLAN**

Table 8-3 lists the highway projects funded under the major infrastructure and expansion program, their costs, and the time frame in which they are projected to be constructed. Pursuant to federal guidance on allowing for inflation, the costs associated with each

highway project are based on the current estimate cost plus 4 percent per year through the year of construction. The location of each project is shown in Figure 8-1.

In addition, Table 8-4 provides a list of bridges costing over \$10 million that are currently scheduled for advertisement.

The next section of Chapter 8 provides a detailed description, current cost, and map for each highway project included in the Recommended Plan.

**TABLE 8-3**

**MAJOR INFRASTRUCTURE AND EXPANSION PROJECTS PROGRAMMED WITH HIGHWAY FUNDING IN THE RECOMMENDED PLAN, WITH COSTS**

	CURRENT COST (2011)	2012–2015	2016–2020	2021–2025	2026–2030	2031–2035	MPO FUNDING	NON-MPO FUNDING*
<b>ONGOING NO-BUILD HIGHWAY PROJECTS</b>								
Route 128 Additional Lanes (Randolph to Wellesley)	\$167,700,000	\$142,700,000	\$25,000,000				\$167,700,000	
Crosby's Corner (Concord & Lincoln)	\$65,000,000	\$65,000,000					\$65,000,000	
<b>RECOMMENDED HIGHWAY PROJECTS</b>								
Middlesex Turnpike Improvements, Phase III (Bedford, Burlington, & Billerica)	\$20,800,000		\$27,400,000				\$27,400,000	
Trapelo Road (Belmont)	\$14,592,000	\$14,592,000					\$14,592,000	
Sullivan Sq./ Rutherford Ave. (Boston)*	\$71,000,000		\$78,100,000				\$78,100,000	\$15,377,710
I-93/Route 3 Interchange – Braintree Split (Braintree)	\$36,000,000					\$85,320,000	\$85,320,000	
I-93/I-95 Interchange (Canton)	\$235,500,000			\$377,040,000			\$377,040,000	
I-95 Northbound/ Dedham St. Ramp/ Dedham St. Corridor (Canton)	\$35,000,000			\$56,040,000			\$56,040,000	
Bruce Freeman Rail Trail (Concord to Westford)	\$18,700,000			\$29,940,000			\$29,940,000	
Route 126/Route 135 Grade Separation (Framingham)	\$58,500,000				\$113,950,000		\$113,950,000	
Route 53 Final Phase (Hanover)	\$1,000,000		\$1,320,000				\$1,320,000	



**TABLE 8 -3 (CONT.)**

**MAJOR INFRASTRUCTURE AND EXPANSION PROJECTS PROGRAMMED WITH HIGHWAY FUNDING IN THE RECOMMENDED PLAN, WITH COSTS**

	CURRENT COST (2011)	2012-2015	2016-2020	2021-2025	2026-2030	2031-2035	MPO FUNDING	NON-MPO FUNDING*
<b>RECOMMENDED HIGHWAY PROJECTS</b>								
Assabet River Rail Trail (Hudson to Acton)	\$18,100,000		\$23,820,000				\$23,820,000	
Route 1 Improvements (Malden, Revere, Saugus)	\$175,196,000					\$415,200,000	\$415,200,000	
Needham St./ Highland Ave./ Winchester St. (Newton & Needham)	\$18,400,000			\$29,460,000			\$29,460,000	
I-93/I-95 Interchange (Reading, Stoneham, Wakefield, & Woburn)	\$276,000,000				\$537,621,000		\$537,621,000	
Bridge St. (Salem)	\$11,223,250		\$14,769,000				\$14,769,000	
Route 18 Capacity Improvements (Weymouth)*	\$31,300,000	\$16,770,000					\$16,770,000	\$14,582,039
Montvale Ave. (Woburn)	\$3,700,000			\$5,924,000			\$5,924,000	
New Boston St. Bridge (Woburn)	\$4,900,000			\$7,850,000			\$7,850,000	
Conley Haul Rd. (Boston)*	\$25,000,000						\$0	\$25,000,000
<b>RECOMMENDED HIGHWAY PROGRAM</b>								
Clean Air and Mobility Program (Regionwide)	\$2,000,000 per yr	\$3,172,300	\$10,937,000	\$12,680,000	\$14,700,000	\$17,039,000	\$58,528,000	
<b>RECOMMENDED TRANSIT PROJECTS USING HIGHWAY FUNDING</b>								
Green Line Extension from Medford Hillside (College Ave.) to Mystic Valley Pkwy (Rte. 16)	\$140,608,000		\$185,031,000				\$185,031,000	
<b>PROJECT TOTAL</b>		<b>\$242,234,000</b>	<b>\$366,377,000</b>	<b>\$518,934,000</b>	<b>\$666,271,000</b>	<b>\$517,559,000</b>	<b>\$2,311,375,000</b>	<b>\$54,959,749</b>
<b>AVAILABLE REVENUE</b>		<b>\$300,490,000</b>	<b>\$569,590,000</b>	<b>\$815,610,000</b>	<b>\$1,018,440,000</b>	<b>\$1,180,650,000</b>	<b>\$3,884,780,000</b>	
<b>PERCENTAGE OF PROGRAM FUNDING</b>		<b>81%</b>	<b>64%</b>	<b>64%</b>	<b>65%</b>	<b>44%</b>	<b>59%</b>	

\* Non-MPO Funding includes earmarks, with the exception of the Conley Haul Road (Boston). This project will be paid for by the Massachusetts Port Authority.

**TABLE 8-4**

**HIGHWAY BRIDGES WITH ESTIMATED COSTS OVER \$10 MILLION**

CITY/TOWN	PROJECT	CURRENT COST	2012-2015	2016-2020	2021-2025	2026-2030
<b>ACCELERATED BRIDGE PROGRAM</b>						
Boston/ Cambridge	Longfellow Bridge	\$260,099,000	\$260,099,000			
Boston	Cambridge St. over the Charles River	\$30,291,000	\$30,291,000			
Boston	North Harvard St. over the Charles River	\$27,646,000	\$27,646,000			
Boston	Casey Overpass over Washington St.	\$33,600,000	\$33,600,000			
Everett/ Medford	Revere Beach Pkwy. over the Malden River	\$41,320,000	\$41,320,000			
Medford	Main St. (Route 38) over the Mystic River (Cradock Bridge)	\$11,620,000	\$11,620,000			
Quincy	Fore River Bridge	\$280,000,000	\$280,000,000			
Revere	Revere Beach Pkwy. over MBTA	\$15,293,000	\$15,293,000			
Revere	Blue Line and Revere Beach Pkwy.	\$10,000,000	\$10,000,000			
Somerville	Route 28 over Washington St.	\$22,910,000	\$22,910,000			
<b>TOTAL ACCELERATED BRIDGE PROGRAM</b>		<b>\$732,779,000</b>	<b>\$732,779,000</b>			
<b>STATEWIDE BRIDGE PROGRAM</b>						
Boston	Massachusetts Ave. over Route 2A (Commonwealth Ave)	\$23,184,000	\$23,184,000			
Boston	North Washington St. over the Charles River	\$55,000,000		\$72,400,000		
Lexington	Route 2A over I-95	\$20,456,000	\$20,456,000			
Lynn/Saugus	Bridge Route 107 over the Saugus River	\$41,433,000	\$41,433,000			
Needham/ Wellesley	Route 128 Add-A-Lane Bridge (Contract V)	\$10,500,000	\$10,500,000			
<b>TOTAL STATEWIDE BRIDGE PROGRAM</b>		<b>\$95,573,000</b>	<b>\$95,573,000</b>	<b>\$72,400,000</b>		
<b>AVAILABLE STATEWIDE BRIDGE REVENUE</b>			<b>\$154,570,000</b>	<b>\$213,270,000</b>		





## **BEDFORD, BILLERICA, AND BURLINGTON: MIDDLESEX TURNPIKE, PHASE 3 (\$20,800,000)**

### **Description**

The proposed improvements will widen Middlesex Turnpike from 800 feet north of Plank Street to 900 feet north of Manning Road. The widening will provide two lanes in each direction, making it a four-lane highway with a median. There will be left-turn lanes at key intersections. The improvements span a segment of approximately 1.5 miles and include the reconstruction of the bridge over the Shawsheen River. The roadway cross-section width will increase to 70 feet, and the total right-of-way will be 85 feet wide. Each direction will consist of a 14-foot outside travel lane, a 13-foot inside travel lane, and a 16-foot median. The median will be reconfigured at key intersections and driveways as a 4-foot median with a 12-foot protected left-turn lane. On the east side of the 70-foot travel way is a 7-foot grass strip, and on the west side are a 3-foot grass strip and a 4-foot concrete sidewalk.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### **Land Use**

The project consists of a corridor that spans two communities, Bedford and Billerica. The area in Bedford is zoned for industrial park, industrial, general business, and residential uses. The area in Billerica is zoned for industrial uses.

#### **Safety**

There are no high-crash locations within the study area for the years 2006 to 2008, according to MassDOT's list of the Top 200 High-crash intersections.

#### **Mobility**

According to MassDOT traffic counts conducted in 2004, the average daily traffic on the Middlesex Turnpike at the Bedford town line was 19,600 vehicles. According to the draft environmental impact report (DEIR) done in 1995, a Roadway Segment Capacity Analysis showed that Middlesex Turnpike operated at a level of service (LOS) E in the AM and PM peak hours, and that at six out of seven intersections along the turnpike, the critical movement in the AM and PM peak hours operated at LOS F. In terms of delay, the Congestion Management Process monitoring conducted in 2002 found that the average travel speed is below 70 percent of the posted speed along four segments in both the northbound and southbound directions, in both the AM and PM peak periods.

#### **Economic Opportunities**

According to the DEIR, improving the capacity, efficiency, and safety of this roadway will help improve the redevelopment opportunities of this area.

**MAP 8-1**

**BEDFORD, BILLERICA, AND BURLINGTON:  
MIDDLESEX TURNPIKE, PHASE 3**





## BELMONT: TRAPELO ROAD (\$14,592,000)

### Description

This project will be a reconstruction of Trapelo Road from the Cambridge city line to Waverly Oaks Road (Route 60), a length of 2.5 miles. The project will provide traffic signal, sidewalk, bicycle, and streetscape improvements. It will also include the following improvements:

- Construction of a second culvert at Beaver Brook to alleviate flooding
- Fully actuated traffic signals
- ADA-compliant sidewalks throughout both sides of the corridor
- Reduced traffic lane widths to accommodate a bicycle shoulder

### Project's Context/Possible Impacts, by MPO Policy Area

#### Livability

The project enhances livability by improving the viability of walking, bicycling, and taking the MBTA. Pedestrian improvements consist of new or widened and ADA-compliant sidewalks, shortened crossings, and streetscape enhancements. The reduction in traffic lane widths to accommodate 5-foot bicycle lanes will enhance access for bicyclists. These improvements will improve bicyclist and pedestrian access to the Waverley Commuter Rail Station and Shaws Supermarket. The modernization of 13 traffic signals along the corridor will also improve MBTA bus service by reducing the delays for the trackless trolleys that traverse the roadway.

#### Land Use

The project area is zoned for a mix of uses, including commercial and residential (multi-family and single-family housing). The area within one-half mile of the corridor is fully developed, with only a handful of underutilized parcels.

#### Safety

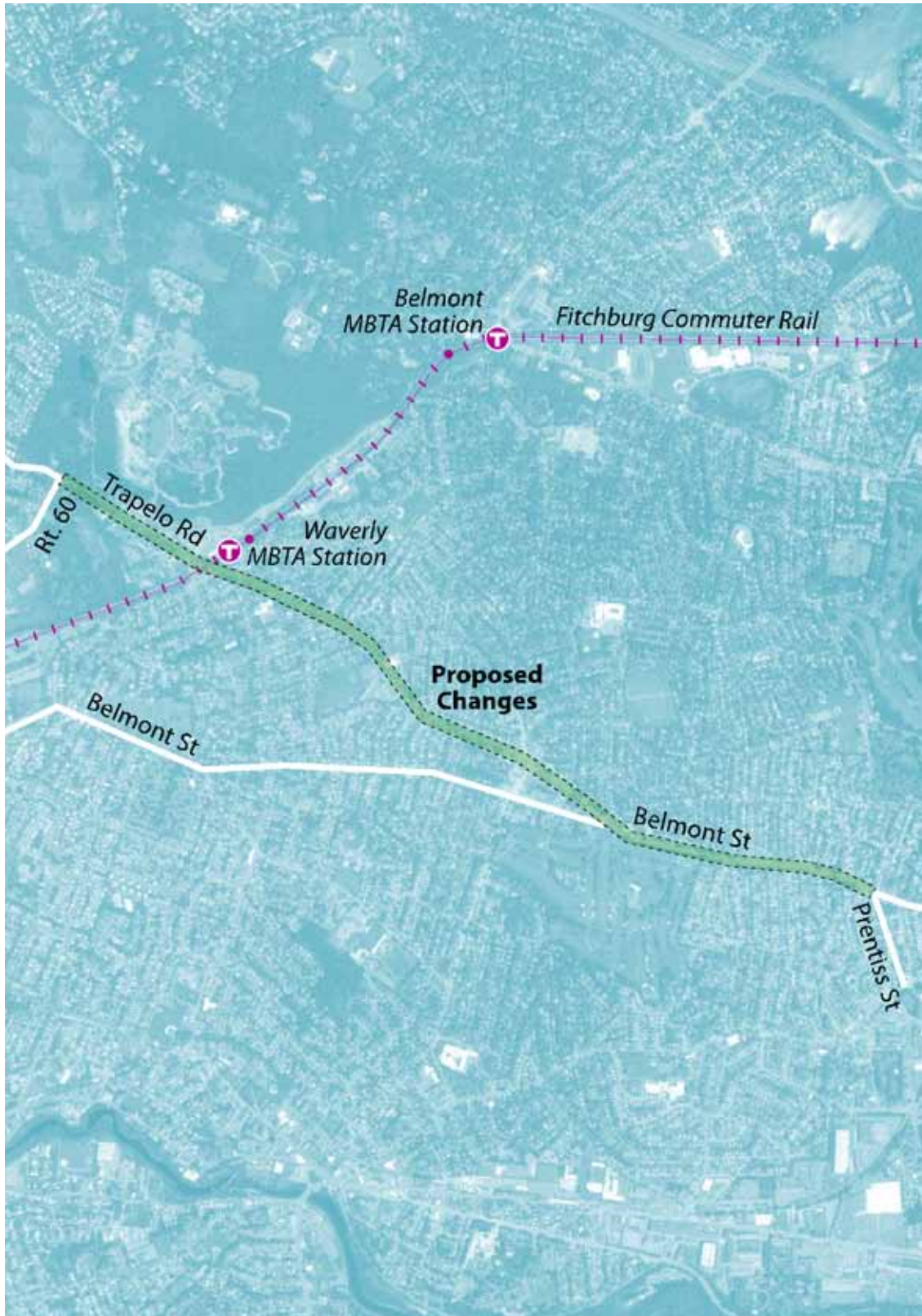
There are no high-crash locations within the study area according to MassDOT's list of the Top 200 High-crash intersections for the years 2006 to 2008.

#### Mobility

According to traffic counts by the Transportation Data Corporation (TDC) in 2005, the average daily traffic volume on Trapelo Road ranges from 15,000 vehicles (along Belmont Street and along Trapelo Road east of Pleasant Street) to 30,000 (along Trapelo Road west of Pleasant Street). Trapelo Road operates at a level of service (LOS) C during the AM and PM peak periods. The current posted speed limits on Trapelo Road are 30 mph, but average peak-period speeds are 16.4 mph in the AM and 15.3 mph in the PM.

#### Connectivity

The proposed improvements will improve the connectivity of the area by promoting the use of alternative transportation modes (walking, bicycling, and transit).





## **BOSTON: CONLEY TERMINAL DEDICATED FREIGHT CORRIDOR AND BUFFER OPEN SPACE (\$25,000,000 ESTIMATED)**

### **Description**

The proposed Conley Terminal Dedicated Freight Corridor (CTDFC) project will construct a new terminal access road that will remove container truck traffic from residential East First Street and portions of Summer Street in South Boston. Conley Terminal, New England's only international container terminal, is owned and operated by the Massachusetts Port Authority (Massport). The 101-acre facility has experienced steady growth since the introduction of direct Asian carrier service in 2002. Massport will fund this project.

The project will construct approximately 3/4 mile of dedicated roadway for container trucks, as well as other service truck traffic, between Paul W. Conley Container Terminal in South Boston, and a new intersection on Summer Street, south of the Reserved Channel.

In addition, the project will create a 4.5-acre buffer open space along East First Street that will separate and screen nearby residents from CTDFC and terminal operations.

The project will provide the following elements:

- New haul road alignment serving Conley Terminal, with the potential to segregate inbound and outbound movements on one-way roads under the full Build scenario
- A reconfigured MBTA layover area along East First Street and the opportunity for buses to access the layover area via the haul road
- Service access to the existing MBTA power plant via the haul road
- Access to the existing lobster terminal and future land uses along the Reserved Channel
- Potential to provide access to the Exelon property from the north or east along new roadways
- A 100-foot-wide green space as a buffer offering the potential for new east-west linear park connections



**MAP 8-3**

**BOSTON: CONLEY TERMINAL DEDICATED FREIGHT CORRIDOR  
AND BUFFER OPEN SPACE**



## **BOSTON: RUTHERFORD AVENUE/SULLIVAN SQUARE (\$71,000,000)**

### **Description**

The Rutherford Avenue project seeks to transform the corridor's highway-like design into a multimodal urban boulevard. The Rutherford Avenue corridor in the Charlestown neighborhood of Boston extends about 1.5 miles from the North Washington Street Bridge to the Sullivan Square MBTA Orange Line station. The existing corridor consists of 8 to 10 lanes that facilitate high-speed automobile travel. Although this roadway layout served high volumes of traffic during the construction of the Central Artery/Tunnel project, it now acts a barrier to the neighborhood. The existing roadway creates significant challenges and safety issues for pedestrians and bicyclists seeking to reach various destinations, including Bunker Hill Community College, Paul Revere Park, the Hood Business Park employment area, and MBTA rapid transit stations.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### **Livability**

Through the transformation of the highway-like roadway into a multimodal urban boulevard, the project will improve pedestrian and bicycle safety along the corridor and access to the Community College and Sullivan Square MBTA stations on the Orange Line. The at-grade urban boulevard will eliminate the underpasses at Sullivan Square and Austin Street, add a 12-to-16-foot-wide landscaped median, and reduce the roadway to two travel lanes in each direction, with turn lanes at intersections. The livability elements consists of adding 10-foot sidewalks, creating a 20-to-40-foot linear park or buffer, installing 10 traffic signals and crosswalks, shortening crossings, planting 900 trees, and possibly adding a 5-foot wide bike lane in the southbound direction. The designation of exclusive bus lanes at Sullivan Square Station will also improve bus operations for nearly 10 MBTA routes.

#### **Land Use**

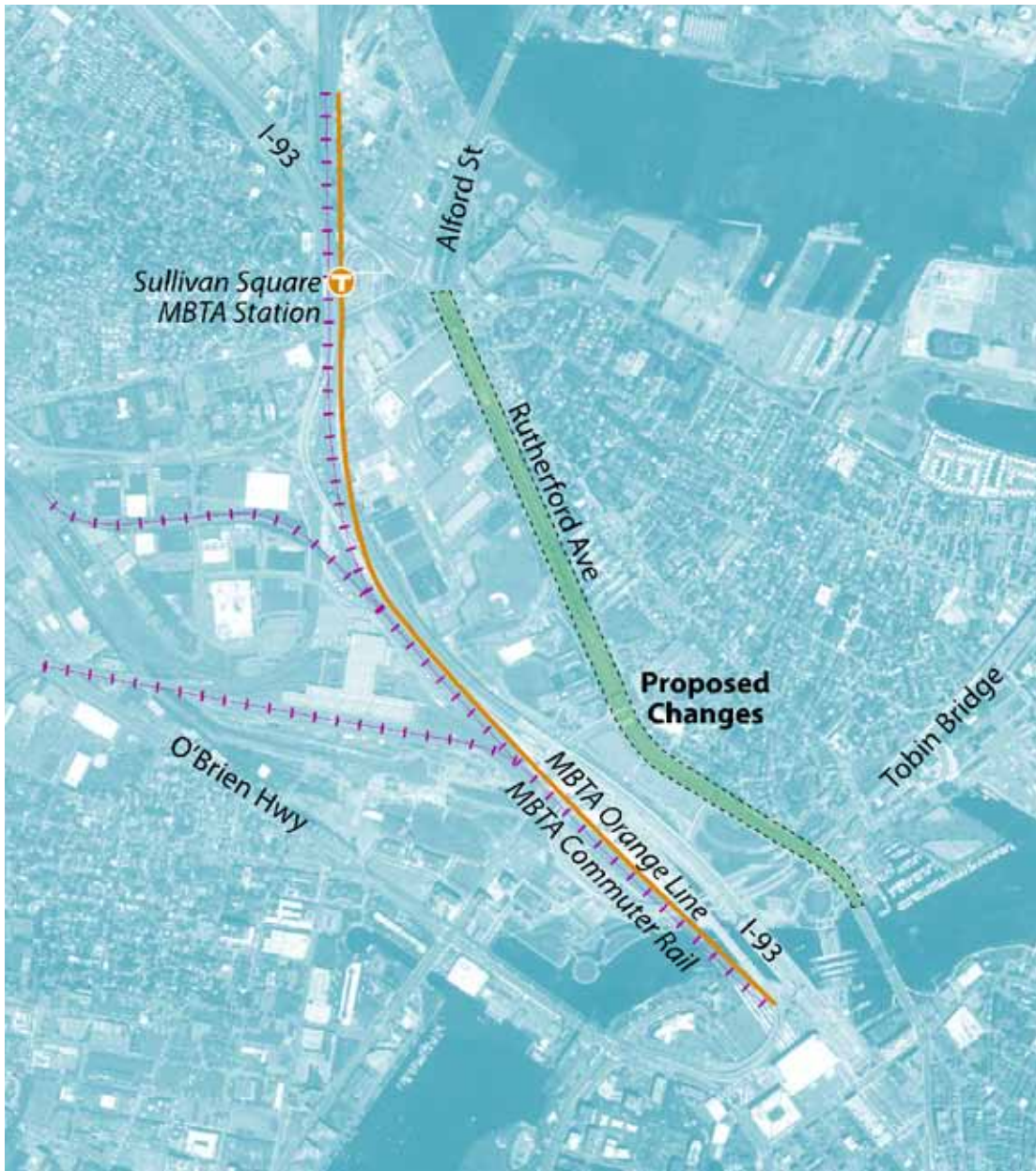
The plans for reconfiguring the Sullivan Square roadway network also provide an opportunity to create land parcels for transit-oriented-development (TOD) that will be well suited and well located for commercial and residential redevelopment by the private sector. Many of the parcels in the Sullivan Square area are publicly owned, by either the MBTA or the City of Boston, which opens the doors for possible public-private partnerships.

#### **Safety**

There are no high-crash locations within the study area for the years 2006 to 2008, according to MassDOT's list of the Top 200 High-crash intersections.

#### **Mobility**

The design includes mobility improvements for all modes through widened sidewalks, shortened crossings, on-street parking lanes, bicycle lanes, and designated exclusive bus lanes to improve bus operations at the station.



### Connectivity

The project provides improvements around Sullivan Square by reconfiguring the roadways into an urban grid system of streets to regularize traffic movements and allow for safe street crossings for pedestrians accessing the Sullivan Square MBTA station.

## BRAINTREE: I-93/ROUTE 3 INTERCHANGE (BRAINTREE SPLIT) (\$36,000,000)

### Description

Through its Congestion Management Process, the Boston Region MPO recommended a study of the Braintree Split. The Central Transportation Planning Staff produced a report for the MPO, *I-93/Southeast Expressway/Route 3 (Braintree Split): Operational Assessment and Potential Improvements*, in March 2006. The proposed project addresses mobility and safety issues of the Braintree Split, and includes recommended improvements at the following three locations:

- Route 3 South, between Burgin Parkway and Union Street – additional travel lane and acceleration lanes
- I-93 North On-Ramp from Route 37 East in Braintree – ramp and interchange improvements
- I-93 South, between Route 37 and Route 24 – additional travel lane with interchange improvements

### Project's Context/Possible Impacts, by Relevant MPO Policy Area

#### Land Use

Land surrounding the split in Braintree is zoned Highway Business Residential. The split continues over the town border into Quincy, where adjacent land is zoned Heavy Industrial and Planned Unit Development.

#### Safety

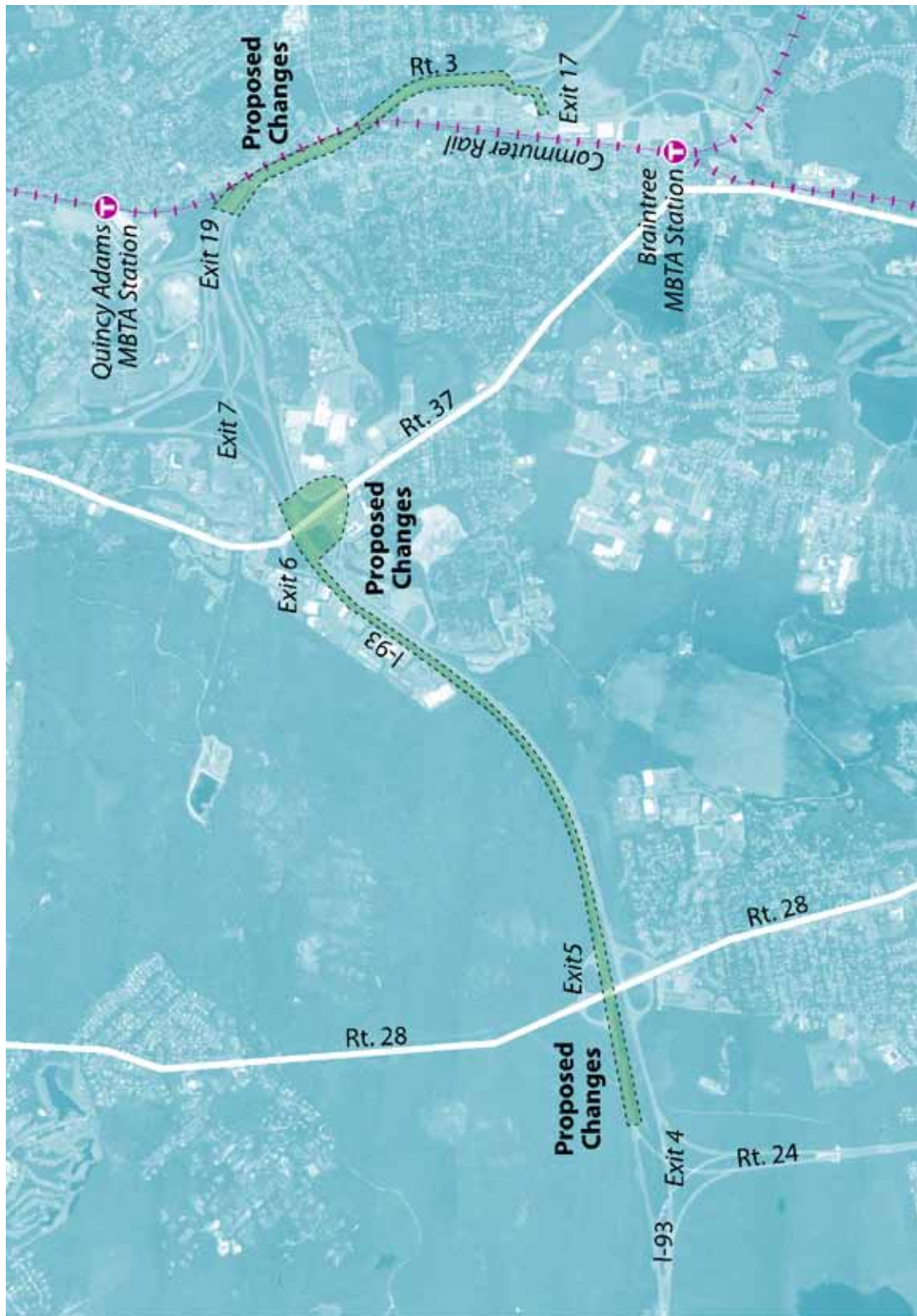
This location is on MassDOT's list of the top 200 high-crash intersection locations for the years 2006 to 2008. The crash total was 671; of these, 434 were property damage only and 233 involved injuries. Four of the crashes involved fatalities. It ranked number one on the list of the state's high-crash locations for that time period. The Braintree Split is also one of the region's top truck-crash locations.

#### Mobility

According to MassDOT's data on 2006 traffic volumes, average daily two-way traffic on I-93 north of Route 37 was 200,600. Average daily two-way traffic on Route 3 between Exits 17 and 19 was 128,800 in 2003. Average daily two-way traffic on Route 3 between Exits 19 and 20 was 115,900 in 2003.

#### Connectivity

The Braintree Split is located near the Quincy Adams Station on the Red Line.



## CANTON: I-95/I-93 INTERCHANGE (\$235,500,000)

### Description

Specific components of the Interstate 95/Interstate 93 interchange project are:

- Replacement of the I-95 northbound entrance ramp with a direct connector ramp
- Construction of a new entrance ramp from University Avenue to I-93 northbound, including the discontinued use of the Green Lodge Street Bridge west of Elm Street
- Construction of a realigned, two-lane direct connection between Route I-93 southbound and I-95 southbound, including a new ramp to Blue Hill Drive
- Construction of a realigned, two-lane, direct connection from I-95 northbound to I-93 northbound
- Widen Dedham Street over I-95 to five lanes. Dedham Street will be widened to four lanes from I-95 to University Avenue in Westwood. Improvements will also be made to the Canton Street/University Avenue Intersection in Westwood.

### Project's Context/Possible Impacts, by MPO Policy Area

#### Land Use

The 37 acres encompassed by this project are located entirely within the Fowl Meadow/Ponkapoag Bog Area of Critical Environmental Concern. Much of the land surrounding the interchanges is permanently protected, although some of it is zoned for single residences and light industry. According to the Environmental Notification Form (ENF) that was submitted to the state's Department of Environmental Protection, the project, as proposed, will decrease roadways and other paved areas by 1.7 acres.

#### Safety

This project is on MassDOT's list of the top 200 high-crash intersection locations for the years 2006 to 2008, I-93 at I-95 was the site of 300 crashes, of which 212 involved only property damage and 88 involved bodily injury. None of the crashes were fatal. It ranked #127 on the list of the state's high-crash intersections. There are recurring safety problems, including numerous truck rollovers, on the I-95 northbound ramp.

#### Mobility

The ENF identifies chronic congestion in the project area in both the morning and afternoon peak periods, with the roadways and the interchanges frequently functioning at level of service F. Severe congestion at the intersection of University Avenue and Blue Hill Drive causes long queues that occasionally extend beyond the I-95 southbound exit ramp to Blue Hill Drive. Traffic volume data show that there were 134,700 vehicle-trips per day on the I-95 section of the project in 2004 and 167,300 trips on the I-93 section in 2006.

#### Connectivity

By reducing congestion and travel times, this project will enhance the attractiveness of Amtrak and MBTA commuter rail services at the Route 128 station, as well as shuttle



bus services connecting the station to residential and business centers in the area. The project will also facilitate greater recreational use of the Blue Hill Reservation trail system that runs through the area.

### Note

This project implements the recommendations of the University Avenue/I-95/I-93 Regional Traffic Study that was prepared by the Central Transportation Planning Staff in July 1999. It is also consistent with the Canton, Dedham, Norwood, and Westwood Municipal Growth Planning Study.

The environmental impact report currently underway includes the Dedham Street/I-95 Northbound Ramp project (see the separate project description which follows this one). The projects are presented separately in order to show the areas in greater detail.



## **CANTON: I-95 NORTHBOUND/DEDHAM STREET RAMP (\$35,000,000)**

### **Description**

Construct a new ramp from Interstate 95 northbound to Dedham Street in Canton. This will complement the benefits of the recently completed construction of the Dedham Street/I-95 southbound ramp by providing direct access to the town of Canton and the town of Westwood's University Avenue industrial area. This project is considered part of the Canton/Westwood I-95/I-93/University Avenue project.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### **Land Use**

This project is located in the Fowl Meadow/Ponkapoag Bog Area of Critical Environmental Concern. Adjacent land is zoned for light industry and single-family residences.

#### **Mobility**

This project will benefit local streets in the area by enabling I-95 northbound traffic destined for the University Avenue area to avoid local residential streets without increasing through traffic on Dedham Street. Users of the University Avenue/Blue Hill Drive area will also benefit.

#### **Connectivity**

By reducing congestion and travel times, this project will enhance the attractiveness of Amtrak and MBTA commuter rail services at the Route 128 station, as well as shuttle bus services connecting the station to residential and business centers in the area.

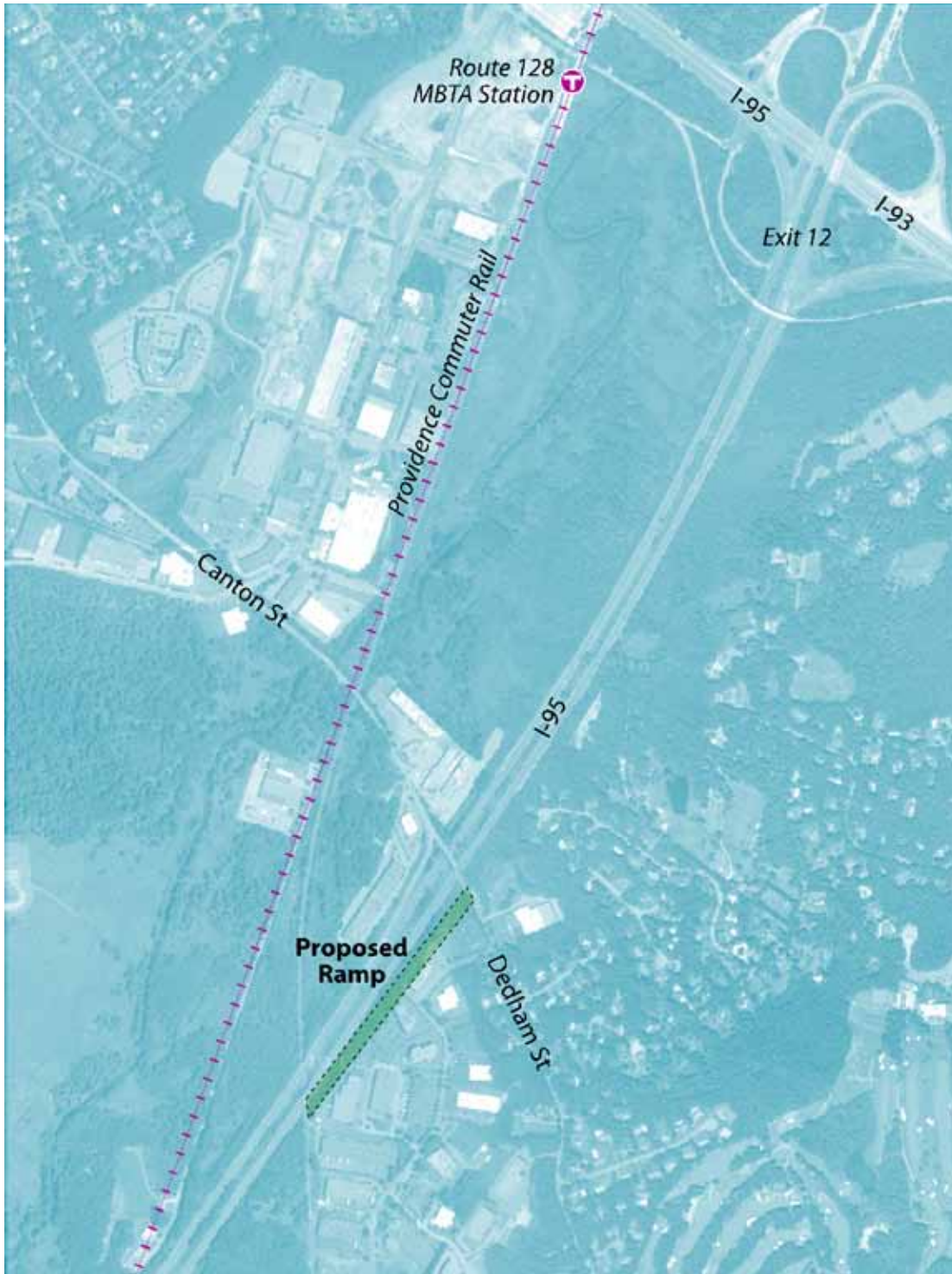
#### **Note**

This project implements the recommendations of the University Avenue/I-95/I-93 Regional Traffic Study that was prepared by the Central Transportation Planning Staff in July 1999. It is also consistent with the Canton, Dedham, Norwood, and Westwood Municipal Growth Planning Study.



**MAP 8-7**

**CANTON: I-95 NORTHBOUND/DEDHAM STREET RAMP**





## CONCORD TO WESTFORD: BRUCE FREEMAN RAIL TRAIL (\$18,700,000)

### Description

This project will include two construction phases (Phase 2A and 2C) of the Bruce Freeman Rail Trail (BFRT). The new trail will extend beyond the Phase 1 segment, which has already been completed, beginning in Acton and ending at the Concord-Sudbury town line. It will run along the Framingham and Lowell railroad corridor.

Phase 2A will extend from the end of the BFRT Phase 1 section of the trail (the Westford-Lowell Phase) and continue south through Westford, Carlisle, and Acton, a total length of approximately 4.88 miles. It includes the following:

- A new variable-width (ranging from 10 to 12 feet) paved asphalt multi-use rail trail
- Two-foot stabilized shoulders
- An adjacent six-foot-wide stone dust trail (provided where feasible)
- Trail pavement markings and signage
- Passively actuated flashing beacons at trail and roadway crossings
- New roadway pavement markings and signage at trail crossings
- Construction of a prefabricated pedestrian bridge structure over Route 2A/119, and rehabilitation of six existing railroad bridges along the trail
- Construction of culverts, earthwork, landscaping, and other items incidental to the construction of the rail trail.

Phase 2C will include the construction of a 2.5-mile trail section from Commonwealth Avenue south to Powder Mill Road in Concord. The section from Powder Mill Road to the Sudbury town line will be addressed in cooperation with the Town of Sudbury as they develop plans for the trail in their town.

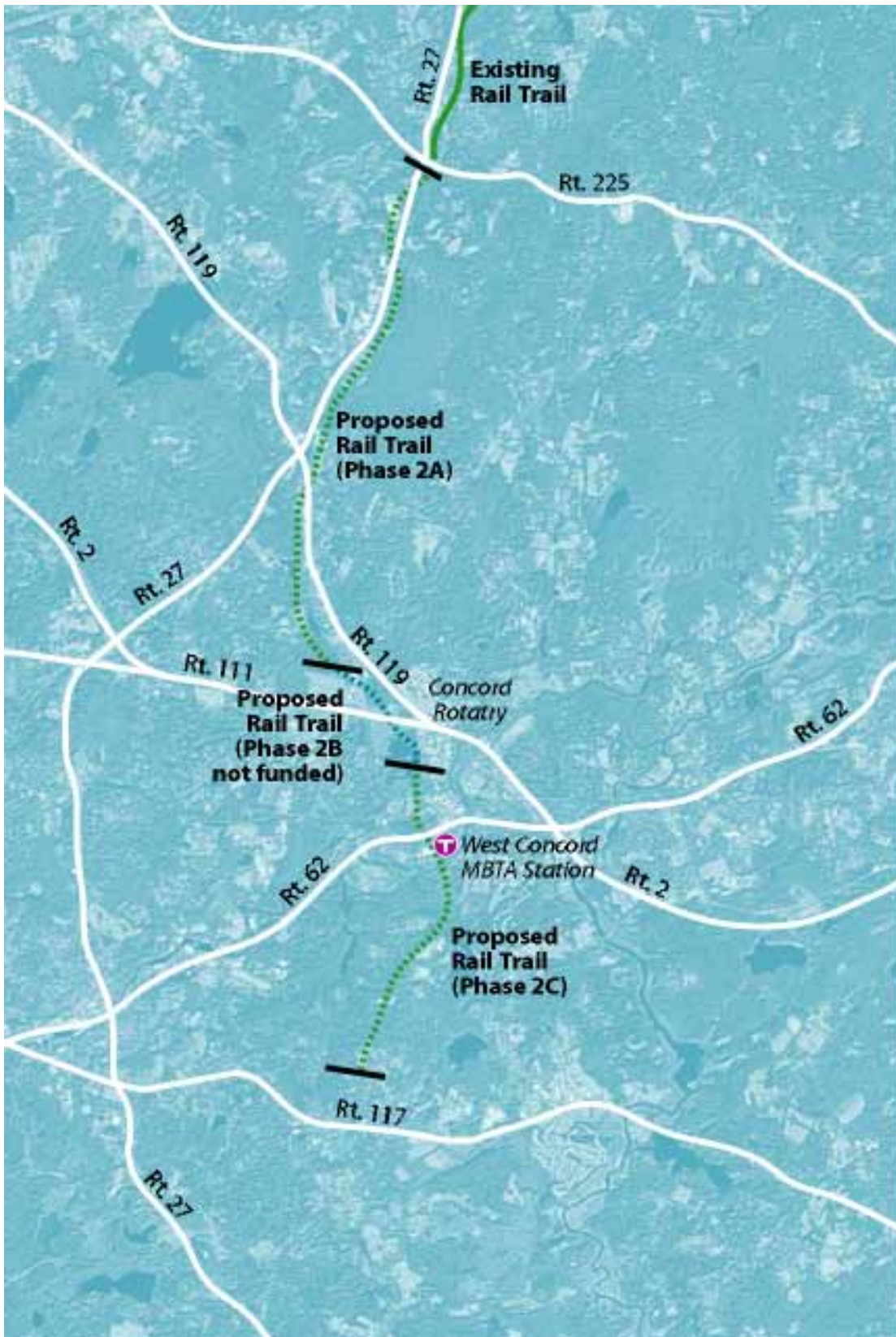
Phase 2B is not part of this project but it will be part of the Concord Rotary project. Phase 2B is the section of the BFRT from Commonwealth Avenue in Concord to the Acton town line.

The completed BFRT will span approximately 17 miles and will serve as a multimodal alternative transportation route that will connect eight municipalities to various destinations, including downtowns, commuter rail stations, schools, and scenic areas.

### Project's Context/Possible Impacts, by MPO Policy Area

#### *Livability*

The rail trail will provide a safe route for alternative transportation modes to reach numerous destinations, including downtowns, commuter rail stations, schools, and scenic areas.





## FRAMINGHAM: ROUTE 126/ROUTE 135 GRADE SEPARATION (\$58,500,000)

### Description

Construct a 700-foot, below-grade underpass (one travel lane in each direction) from Park Street to Irving Street, allowing through traffic on Route 126 (Concord Street) to pass underneath Route 135 (Waverly Street) and the railroad tracks. The majority of the underpass will consist of an ascending/descending ramp with an open roof; approximately 135 feet of it will be a tunnel under Route 135 and the railroad tracks.

Travel lanes will be maintained at grade on Route 126 to intersect with Route 135, with upgraded signalization. Each approach to this intersection will have at least two lanes, and all turning movements will be permitted. The open-box configuration of the underpass will prohibit traffic on Howard Street from crossing Route 126 (Concord Street) and will preclude southbound traffic on Route 126 from turning left onto Irving Street.

The design concept for the project includes extensive streetscape amenities, such as widened sidewalks, street trees, decorative lighting, and benches. The project also has the potential to encourage economic development in downtown Framingham, partially through the redevelopment of parcels taken for the roadway reconstruction.

Construction of this project will require land takings, including sites currently in use by downtown businesses. It will also necessitate the elimination of approximately 30 on-street parking spaces.

### Project's Context/Possible Impacts, by MPO Policy Area

#### Land Use

This project is located in Framingham's central business district, which, according to the Executive Office of Environmental Affairs and the Metropolitan Area Planning Council's buildout analysis, is subject to absolute development constraints, but is also a designated redevelopment district. According to the Route 126 Corridor Study, the construction of this project would help facilitate downtown redevelopment by making the downtown area a more attractive location and by providing redevelopment sites through the partial taking of business sites as necessary for the roadway work.

#### Safety

This project is located at a high-crash location – between 2006 and 2008, Route 126 at Route 135 has been the site of 186 crashes, of which 143 involved only property damage and 43 involved bodily injury. As such, it ranked #82 on the list of the state's high-crash intersections. As described above, the design of this project maintains all current movements at the intersection, while providing additional travel lanes for through traffic.

#### Mobility

This project provides additional travel lanes for through traffic on Route 126, bypassing at-grade intersections with Route 135 and the railroad tracks. According to MassDOT data on 2005 traffic volumes, the average daily traffic on this segment of roadway is approximately 19,700 vehicles. The Route 126/Route 135 intersection functions at level of service F in the AM and PM peak periods. In terms of delay, the intersection is tentatively rated as the second worst in the MetroWest subregion and the eighth worst in the Boston region MPO area (source: 2001/2002 Congestion Management System monitoring).



### Connectivity

The Framingham commuter rail station is located near the project site; however, the project does not significantly affect either vehicle or nonmotorized access to the station. Most Metrowest buses that serve downtown Framingham connect at a bus stop on the corner of Route 126 and Howard Street; the project as envisioned will eliminate pedestrian and vehicle access across Howard Street. The Metrowest #5 and #6 buses make connections southeast of the project site; the project as envisioned will not impact these route since it accesses the area via the at-grade connection between Route 126 and Route 135.

### Environmental Justice

An MPO-designated community of concern is located in Southeast Framingham adjacent to the project site. This project will facilitate some level of northbound traffic originating from this area or southbound traffic going to the area; however, the project has not been identified as a priority by the environmental justice community.

### Economic Opportunities

According to the Route 126 Corridor Study, this project is closely related to the redevelopment of the downtown Framingham central business district.

### Livability

As currently envisioned, the project includes many streetscape amenities and will facilitate downtown redevelopment, including possible facade improvements in the area of the town common. The project also eliminates a significant congestion point in downtown Framingham.



## HANOVER: ROUTE 53, FINAL PHASE (\$1,000,000)

### Description

This project will widen Route 53 from two to four lanes in Hanover between Route 3 and Route 123, a distance of 0.26 mile. This project is the fifth and final phase of construction along the Route 53 corridor. Previous projects widened Route 53 to four lanes from Route 3 to Mill Street and Mill Street to Rawson Street. This project also includes the following improvements:

- Installation of a new fully actuated traffic signal at the intersection of Route 53 and the Route 3 northbound ramps
- Construction of a second sidewalk and added shoulders to accommodate pedestrians and bicyclists
- Resurfacing, signage, and drainage.

### Project's Context/Possible Impacts, by MPO Policy Area

#### Land Use

The project area is zoned for a mix of uses, though the area along Route 53 is primarily composed of commercial and business properties. Much of the land abutting Route 53 in the project area is subject to absolute development constraints, according to the Executive Office of Energy and Environmental Affairs (EOEEA) and the Metropolitan Area Planning Council (MAPC) build-out analysis.

#### Safety

There are no high-crash locations within the study area according to MassDOT's list of the top 200 high-crash intersections for the years 2006 to 2008.

#### Mobility

According to MassDOT's data on 2006 traffic volumes, the average daily traffic along this segment of the corridor is approximately 23,900 vehicles. Average observed travel speeds on roadways are compiled in the MPO's Congestion Management Process. Average observed speeds on Route 53 in the study area in the AM peak period range from 35 mph to 42 mph in the northbound direction and are greater than 43 mph in the southbound direction. During the PM peak period, average observed speeds in the northbound and southbound directions of Route 53 range from 35 mph to 42 mph.





## **HUDSON TO ACTON: ASSABET RIVER RAIL TRAIL (\$18,100,000)**

### **Description**

This project will include the construction of the Assabet River Rail Trail from Acton, through Maynard and Stow, to Hudson, a distance of 6.6 miles. The work will also include the construction of two new bikeway bridges, replacement of an existing pedestrian bridge, and rehabilitation or replacement of a railroad bridge. The Towns are also proposing a 1,100-foot boardwalk through a wetland area.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### ***Livability***

The rail trail will provide an alternative transportation route that will safely link the Assabet River National Wildlife Refuge with the downtown business districts, retail sectors, playing fields, and the South Acton commuter rail station.







## **MALDEN, REVERE, AND SAUGUS: ROUTE 1 IMPROVEMENTS (\$175,196,000)**

### **Description**

Widen Route 1 from four to six lanes between Copeland Circle (Route 60) and Route 99. As part of this project, the on- and off-ramps at Salem Street and Lynn Street will be reconstructed to provide acceleration/deceleration lanes, better turning radii, and full turning movements. Also, the connection between Route 99 and Route 1 will be improved by providing a normal right-lane merge from Route 99 northbound to Route 1 northbound.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### **Land Use**

Zoning along Route 1 in the project area is primarily residential, light industrial, and highway-oriented businesses.

#### **Safety**

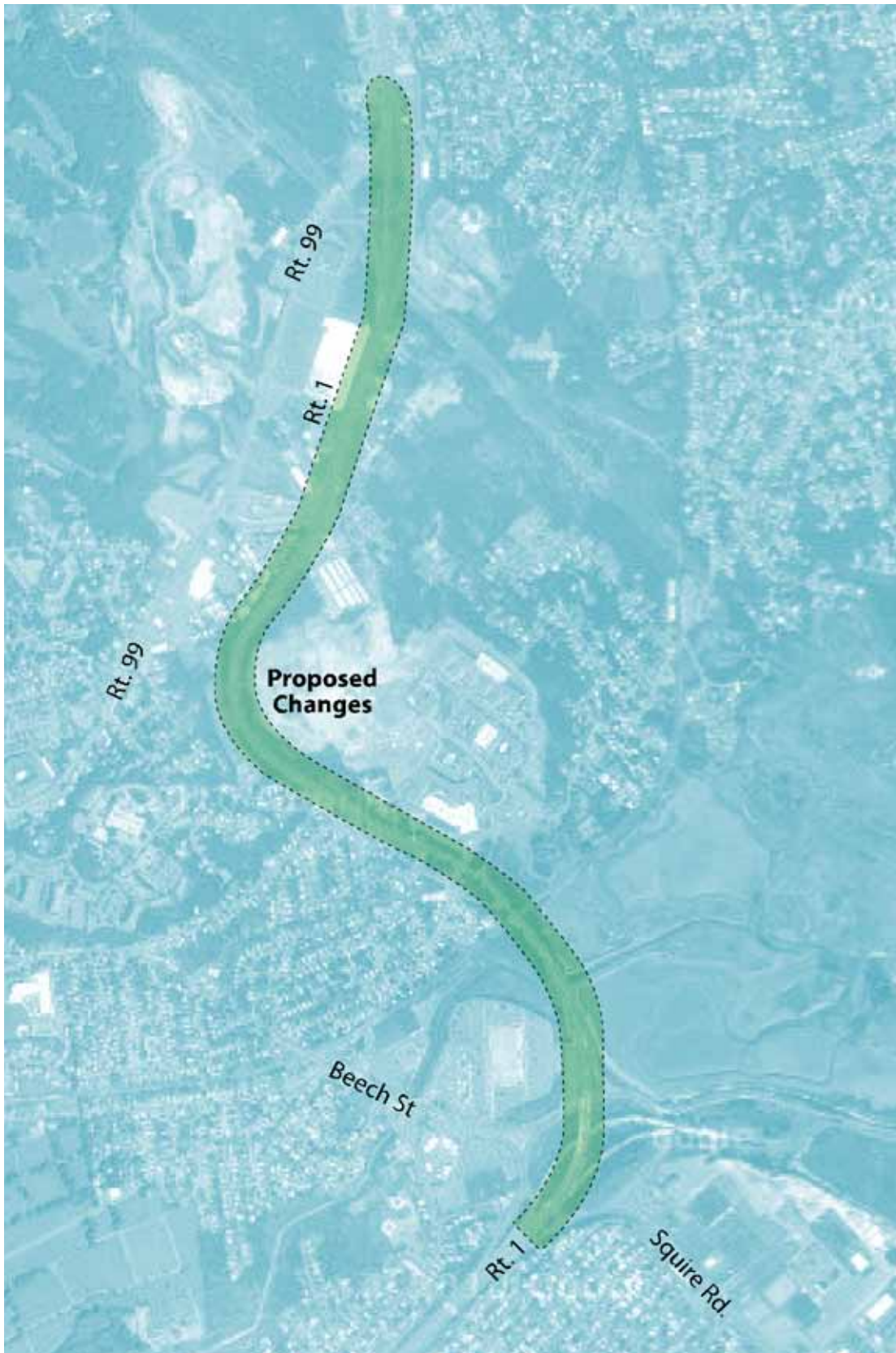
This project area includes a high-crash location – between 2006 and 2008, the intersection of Route 1 and Route 99 in Saugus was the site of 411 crashes, of which 302 involved only property damage and 109 involved bodily injury, with no fatalities. It ranked #44 on the list of the state's high-crash intersections.

In addition, according to the Lower North Shore Transportation Improvement Study conducted by Boston Region MPO staff in 2000, unsafe traffic operations are present at the on- and off-ramps of the Salem Street/ Lynn Street interchange due to the ramps' geometric limitations, including the absence of deceleration and acceleration lanes, the tight turning radii, and the close proximity of adjacent ramps.

#### **Mobility**

Average daily traffic (ADT) along Route 1 at the Malden-Revere city line was 81,600 in 2008, according to traffic volume data compiled by MassDOT, while ADT along Route 1 one-half kilometer north of Sargent Street (south of Route 60) was 66,200 in 2006. Traffic volumes along Route 1 are significantly higher north of Copeland Circle (Route 60), since Route 60 serves as the major east-west connector between towns north of Malden and the coast, Logan International Airport, and the Wonderland Blue Line station. Despite this, Route 1 has six lanes south of Copeland Circle and narrows to four lanes north of the Circle.

According to the Lower North Shore Study, recurring congestion occurs on Route 1 southbound at the Route 60 off-ramp during the AM peak period and on Route 1 northbound at the Route 60 on-ramp during the PM peak period.





## NEEDHAM AND NEWTON: NEEDHAM STREET/HIGHLAND AVENUE (\$18,400,000)

### Description

Needham Street will remain a three-lane cross-section from the Needham Street/Winchester Street/Dedham Street intersection in Newton to the bridge over the Charles River at the Needham town line. The roadway will be rehabilitated and widened to include bicycles, new sidewalks, reconfigured intersections, and updated traffic signals. The Highland Avenue portion of the project will improve the geometry of the roadway from the Highland Avenue/Webster Street intersection in Needham to the Newton town line. Work will include upgrades and the installation of traffic signals at five intersections. The project will also include the reconstruction and widening of the bridge over the Charles River to accommodate four travel lanes.

### Project's Context/Possible Impacts, by MPO Policy Area

#### Livability

The roadway rehabilitation will include bicycle accommodation, new sidewalks, reconfigured intersections, and updated traffic signals to facilitate nonmotorized travel options.

#### Land Use

The project area in Newton along Needham Street is zoned as residential from Route 9 north and as mixed-use and multiresidential from Route 9 south to the Needham town line. The project area in Needham is zoned as industrial from east of Interstate 95 to the Newton town line, and as residential west of I-95.

#### Safety

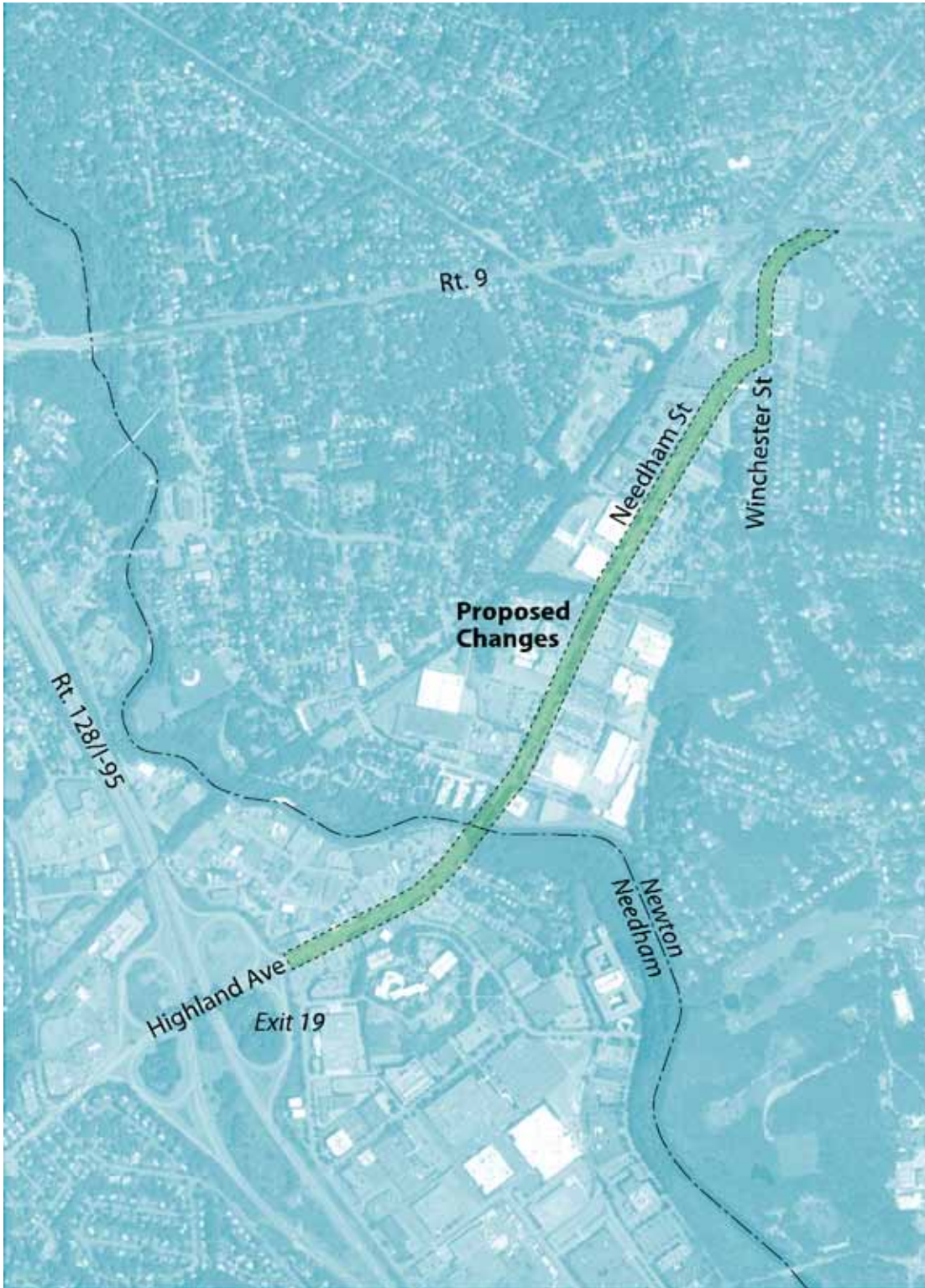
This project area includes one high-crash locations – Highland Avenue at I-95 in Needham. Between 2006 and 2008, the Highland Avenue/I-95 intersection was the site of 331 crashes, of which 267 involved only property damage and 64 involved bodily injury. It ranked #102 on the list of the state's high-crash intersections.

#### Mobility

According to MassDOT data on traffic counts performed in 2002 on Highland Avenue west of Gould Street in Needham, the average daily traffic (ADT) was 23,300 vehicles. The ADT on Needham Street south of Tower Road in Newton in 2001 was 25,200 vehicles. According to counts performed as part of MassDOT's Highland Avenue Corridor Improvements Functional Design Report (FDR) in 2002, the ADT on Highland Avenue east of First Street (just east of I-95 and between the two other count locations) was 36,700 vehicles. Results from the 2001–02 Congestion Management Process monitoring indicate that the average travel speed on both Needham Street and Highland Avenue is 15 mph or less (level of service E/F) along multiple segments of this corridor in the northbound and southbound directions during the AM and PM peak periods.

#### Economic Opportunities

According to both the Highland Avenue Corridor Improvements FDR and the proposed Stop and Shop Supermarket draft environmental impact report, this project would help facilitate redevelopment along this corridor.



## READING AND WOBURN: I-93/I-95 INTERCHANGE (\$276,000,000)

### Description

Improve safety at the junction of Interstate 93 and Interstate 95. The project includes a combination of highway, transit, and transportation demand management improvements as follows:

#### Highway Improvements:

- Add a fourth travel lane to I-95 between I-93 and Route 28 and in the northbound direction only extend the fourth lane to Route 129
- Two new direct connection interchange ramps to remove weaves
- Reconfigured ramps at Route 128 Northbound/Washington Street
- Anticipated noise barriers

#### Transit Improvements:

- Anderson Regional Transportation Center shuttle services
- Increased MBTA reverse peak and local bus service
- New Peabody park-and-ride-lot and shuttle service
- Increased commuter rail – Lowell/Haverhill to Boston

#### Transportation Demand Management:

- Increased marketing, incentives, and signage for transit and carpooling

### Project's Context/Possible Impacts, by MPO Policy Area

#### Land Use

Zoning in the project area is residential, industrial, and business.

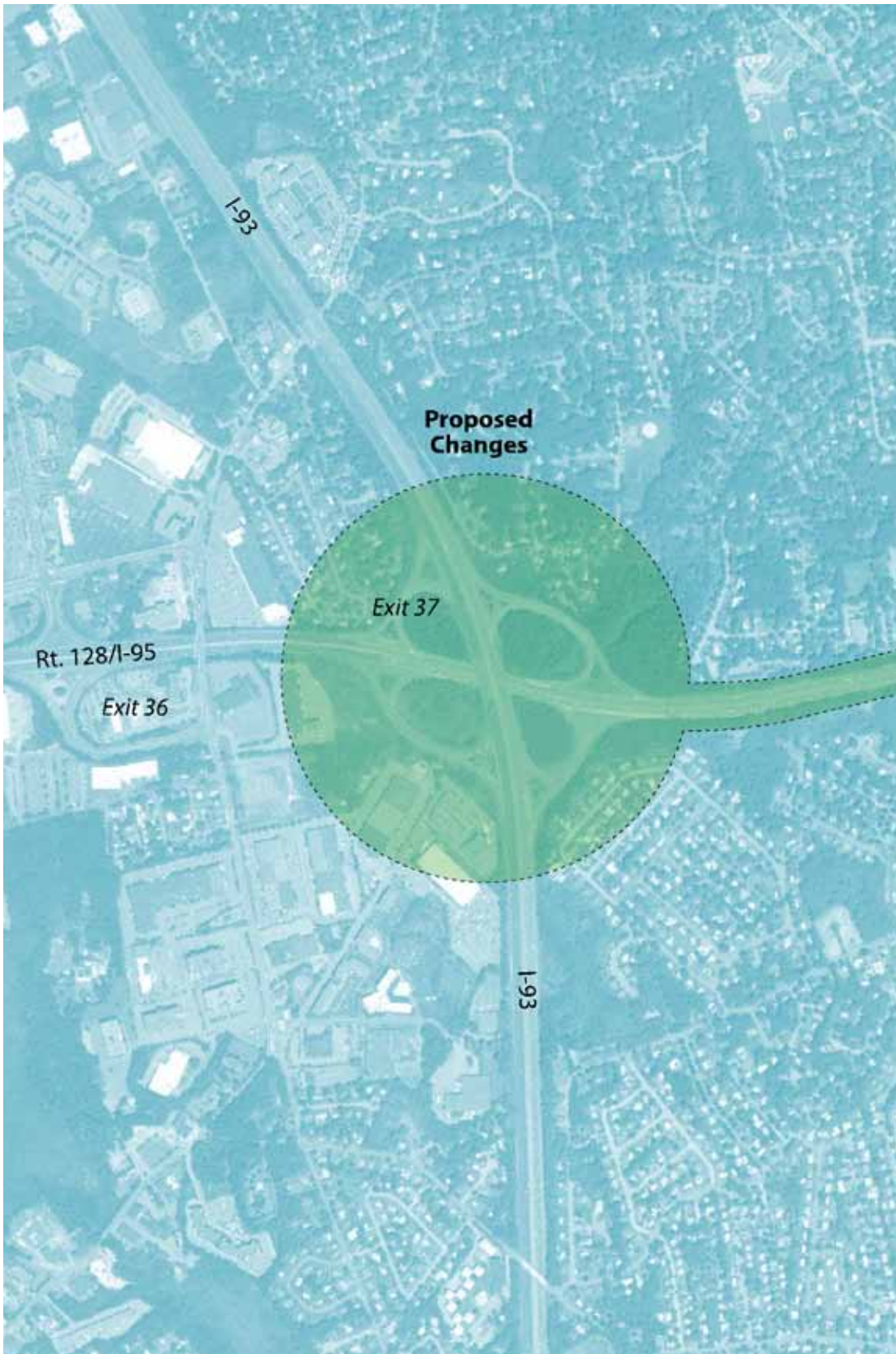
#### Safety

This interchange is a high-crash location—between 2006 and 2008, the I-93/I-95 interchange was the site of 430 crashes, of which 319 involved only property damage and 110 involved bodily injury. It was ranked the #2 high-crash site on the list of the state's high-crash intersections. The interchange also has a high rate of truck crashes, many of which involve trucks rolling over.

#### Mobility

According to MassDOT traffic counts, the average daily traffic on the interstate highways leading into this interchange is as follows:

- I-93 north of I-95 (2010 counts) – 172,900 vehicles
- I-93 south of I-95 (2007 counts) – 184,700 vehicles
- I-95 east of I-93 (2002 counts) – 153,000 vehicles
- I-95 west of I-93 (2005 counts) – 172,700 vehicles





## **SALEM: BRIDGE STREET (\$11,223,250)**

### **Description**

Bridge Street (Route 1A) from Flint Street to Washington Street will be widened to two lanes in each direction.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### ***Livability***

The project will provide new sidewalks and on-road bicycle accommodation to enhance pedestrian and bicyclist access to the Salem commuter rail station.

#### ***Land Use***

A portion of this area of Bridge Street was recently rezoned to the North River Canal Corridor Mixed-Use District to encourage mixed-use redevelopment and better use of the land. A portion of the adjacent land remains residentially zoned for two-family use.

#### ***Safety***

There are no high-crash locations within the study area according to MassDOT's list of the top 200 high-crash intersections for the years 2006 to 2008.

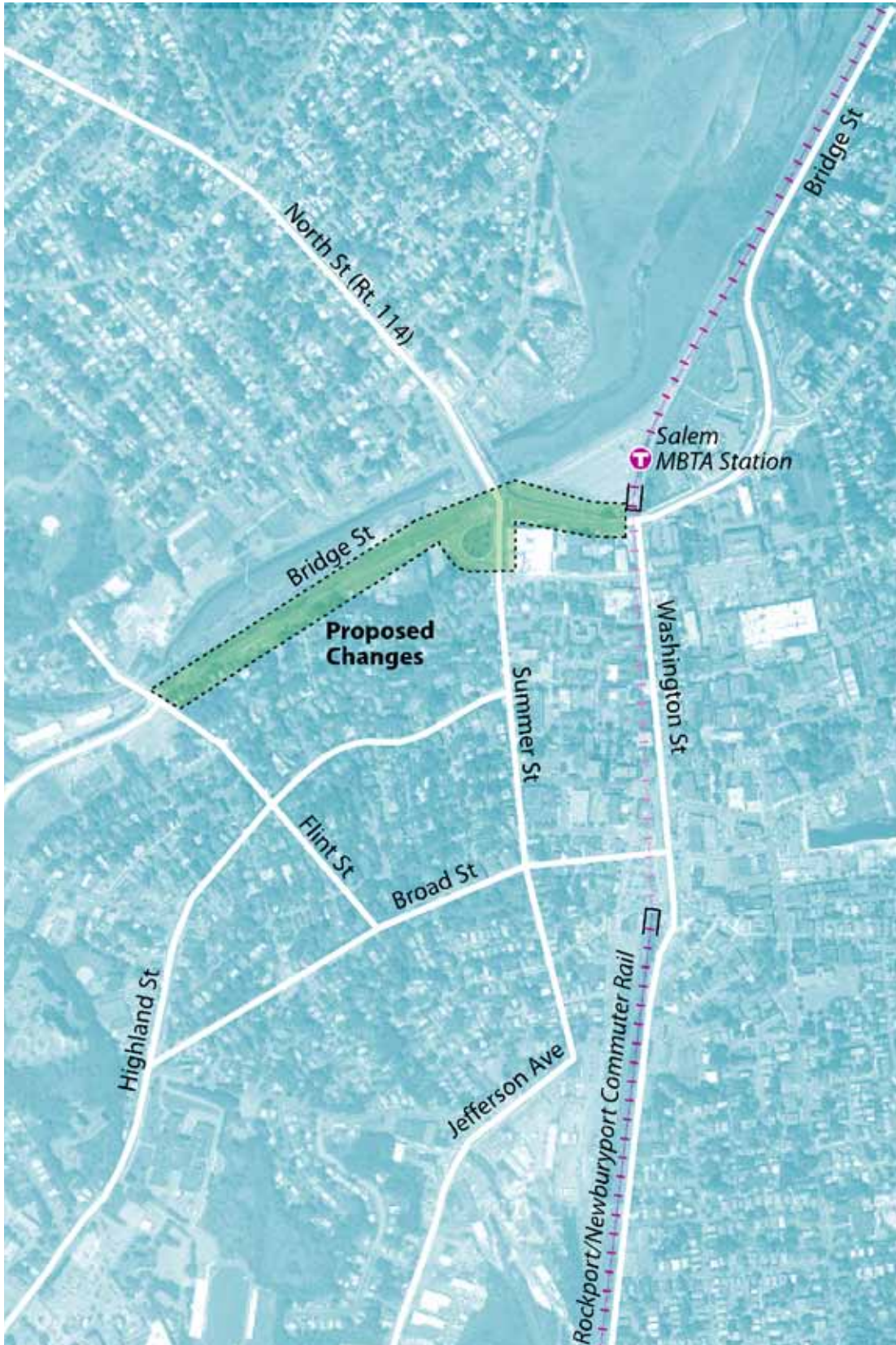
#### ***Mobility***

According to MassDOT traffic counts data, the average daily traffic on Bridge Street north of North Street is 23,900 vehicles (2004 figures).

#### ***Connectivity***

The Salem commuter rail station is located in the vicinity of the project. The MBTA is working to expand parking at this commuter rail station. All MBTA buses that operate in Salem connect at this commuter rail station. The Bridge Street project will improve access to this site and, as envisioned, will enhance pedestrian access on Bridge Street and at the Washington Street rotary.





## WEYMOUTH: ROUTE 18 CAPACITY IMPROVEMENTS PROJECT (\$31,349,250)

### Description

Widen Route 18 to two continuous lanes in each direction (with four-foot shoulders) between Highland Place/Charmada Road (south of Middle/West Street) in Weymouth and Route 139 in Abington. Sidewalks will also be constructed. The Route 18 bridge over the MBTA Old Colony Line (to Plymouth) will be reconstructed and widened.

Intersection improvements (including additional left- and right-turn lanes and some roadway widening between intersections) on Route 18 from Route 3 to Route 139 and including the Middle/West Street intersection. Park Avenue, Columbian Road, and Pond and Pleasant Streets are being constructed as separate projects.

### Project's Context/Possible Impacts, by MPO Policy Area

#### Livability

The project will provide new sidewalks and on-road bicycle accommodation to enhance pedestrian and bicyclist access along the corridor.

#### Land Use

Zoning along the Route 18 corridor in Weymouth includes residential, highway transition, medical services (the South Shore Hospital and other related medical facilities), limited business, and general business. Zoning along Route 18 in Abington is industrial or highway commercial.

#### Safety

This project area includes three high-crash locations – Route 18/Route 3, Route 18/Middle Street, and Route 18/North Avenue – all in Weymouth. Along this corridor between 2006 and 2008, there were 1,192 crashes, of which 931 involved only property damage and 260 involved bodily injury, with one fatality. The Route 18/Route 3 intersection and the Route 18/Middle Street intersection grouped together were ranked #87 on the list of the state's high-crash intersections. The Route 18/North Avenue intersection was ranked #98 on the list of the state's high-crash intersections.

#### Mobility

According to Highway Division traffic counts, the average daily traffic volumes on Route 18 along this stretch of roadway are as follows:

Weymouth:

- North of West Street (2006 counts) – 36,600 vehicles
- North of Park Avenue (2000 counts) – 31,200 vehicles
- North of Pond Street (2006 counts) – 25,200 vehicles

Abington:

- North of Route 139 (2000 counts) – 19,500 vehicles

Intersection analyses were performed as part of the South Weymouth Access Study in August 2000. The existing levels of service (LOS) during the PM peak period were as follows:

## MAP 8-16

## WEYMOUTH: ROUTE 18 CAPACITY IMPROVEMENTS PROJECT

Weymouth:

- Route 18/West Street – LOS E
- Route 18/Park Avenue – LOS C
- Route 18/Columbian Street – LOS E
- Route 18/Pleasant Street – LOS D
- Route 18/Trotter Road – LOS D

Abington:

- Route 18/Route 139 – LOS D

According to 2002 Congestion Management Process monitoring performed by CTPS, the average AM and PM speed on Route 18 in the northbound and southbound directions is calculated to be less than 15 mph for three segments of the roadway in the project area. The average travel speed on Route 18 is below 70 percent of posted speed along 25 segments in the northbound and southbound directions in the AM and PM peak periods. Six signalized intersections in the project area are ranked in the top 25 most delayed intersections (monitored as part of the CMP roadway network) for the South Shore Coalition MAPC subregion in the PM peak period.

### Connectivity

Route 18 provides access to the South Weymouth commuter rail station on the Plymouth Line. The South Shore Tri-Town Development Corporation, responsible for redevelopment of the South Weymouth Naval Air Station, is proposing an expanded, multimodal station in conjunction with the existing South Weymouth commuter rail station.

### Economic Opportunities

This project is a component of the development plan for the former South Weymouth Naval Air Station, which involves the redevelopment of the 1,450-acre site, consistent with the Re-Use Plan formula. The South Shore Tri-Town Development Corporation foresees corporate office park, entertainment, and recreation uses for the site, with more than 60 percent open space (recreational and conservation).



## WOBURN: MONTVALE AVENUE (\$3,700,000)

### Description

This is an arterial and intersection improvement project along Montvale Avenue from Central Street to east of Washington Street in the City of Woburn. It includes the following improvements:

- Widening of Montvale Avenue to four lanes and providing turning lanes at Washington Street
- Reconstruction of roadway and sidewalks
- Installation of new traffic signal system at Central Street and modification of phasing and timing at Washington Street

### Project's Context/Possible Impacts, by MPO Policy Area

#### Land Use

The proposed widening of Montvale Avenue will have minor impacts on the adjacent land uses. The project area contains a mix of uses, but primarily commercial and some residential. Maximum parking requirements and transportation demand management (TDM) requirements for all new developments are imposed. In addition, the project will improve pedestrian and disability access by widening the existing four-foot-wide sidewalks to five or six feet, and adding wheelchair ramps.

#### Safety

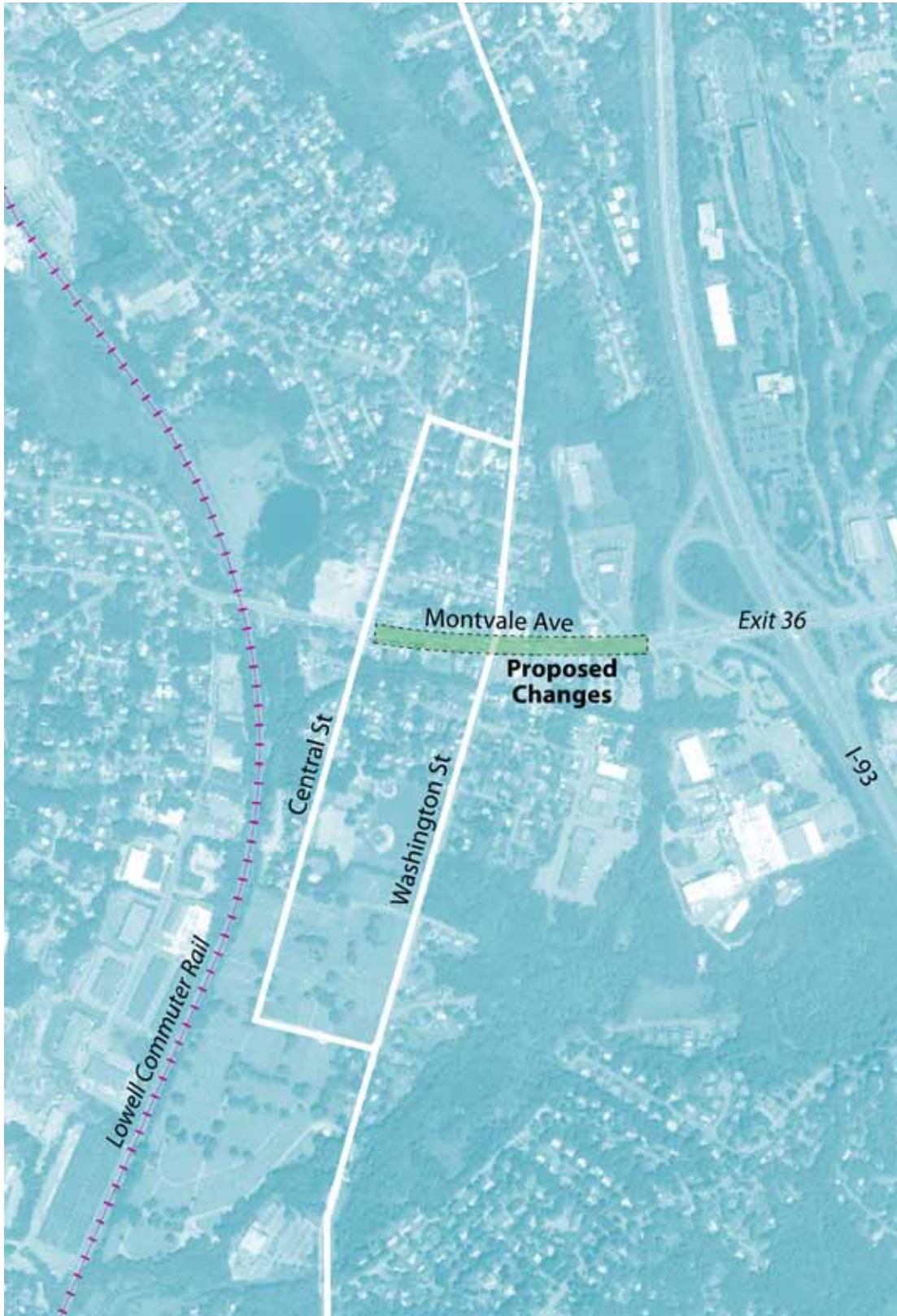
The project area includes a high-crash location at the intersection of Montvale Avenue and the Interstate 93 southbound ramp. The location was ranked #171 on MassDOT's Top 200 Crash Locations Report for the years 2006–2008. A total of 165 crashes were reported during the three-year study period. Though there were no fatalities, 128 involved property damage and 37 involved personal injury.

#### Mobility

Average daily traffic (ADT) along Montvale Avenue east of Washington Street was 36,400 vehicles, according to counts collected by MassDOT. Under 2007 existing conditions, the intersection at Montvale Avenue and Washington Street operated at LOS C in the AM and PM peak periods, while the Montvale Avenue and Central Street intersection operated at LOS A in the AM and LOS B in the PM peak period. Although the LOS of service is acceptable, the proposed improvements will better utilize lane use and increase coordination between the intersections to accommodate increasing traffic volumes.

#### Connectivity

The proposed project area serves as a critical connection between I-93, I-95, and the surrounding Woburn area. The project will enhance MBTA bus operations (Routes 354 and 355) by improving the poor operating and safety conditions. In addition, the project will benefit the pedestrian and bicycle activity that links with nearby schools.





## **WOBURN: NEW BOSTON STREET BRIDGE (\$4,900,000)**

### **Description**

Construct a bridge on New Boston Street at the northern end of Woburn Industrial Park where New Boston Street crosses the MBTA's Lowell Line to Woburn Street in Wilmington. This connection existed until approximately 30 years ago, when the bridge was destroyed by fire; it was never reconstructed.

### **Project's Context/Possible Impacts, by MPO Policy Area**

#### ***Land Use***

The majority of the land in the New Boston Street area in Woburn is zoned for industrial use; the existing development in the area is primarily commercial/industrial. With the recent opening of the Anderson Regional Transportation Center (RTC) and the I-93 Industriplex interchange, the City of Woburn anticipates additional office and retail development in the project area over the next few years. Just north of the proposed project, in Wilmington, the land is zoned as industrial; and includes Southeast Wilmington Industrial Park. Further north on Woburn Street in Wilmington and south of Route 129, the land is zoned as residential.

#### ***Mobility***

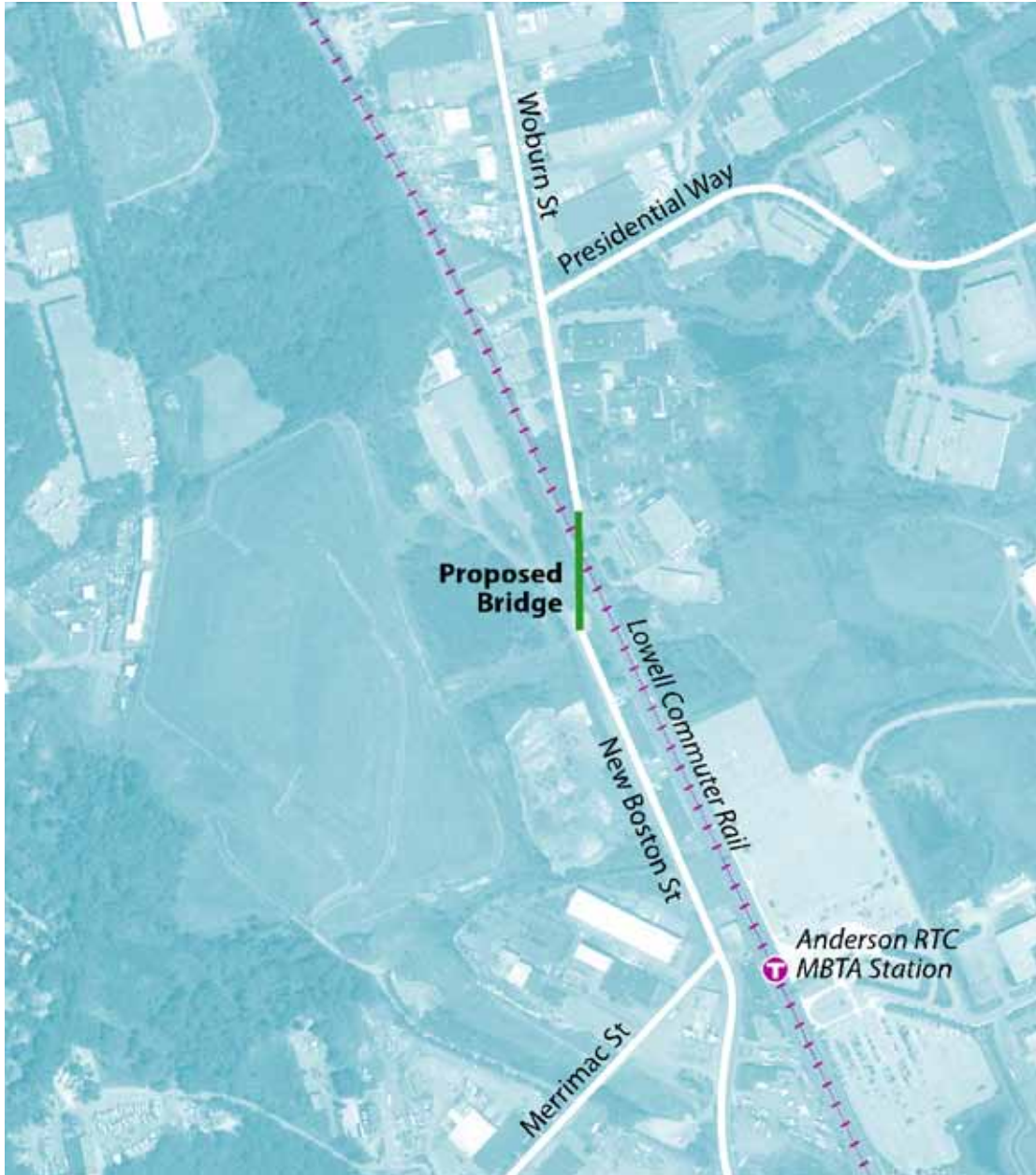
No traffic studies have been performed to date; however, the opening of this bridge would provide a second means of access to the growing Industriplex area for residents of Wilmington and communities to the north, as well as for emergency vehicles from the North Woburn fire station.

#### ***Connectivity***

The Anderson RTC is located just south of the proposed New Boston Street Bridge. The new bridge would provide an additional automobile access point for the park-and-ride and transit services offered at this center.

**MAP 8-18**

**WOBURN: NEW BOSTON STREET BRIDGE**







## TRANSIT PROJECTS IN THE RECOMMENDED PLAN

Table 8-5 lists the transit projects funded under the capacity expansion program, their costs for the period of construction, and when they are projected to be completed. A brief project description of each recommended project and its cost is provided below. The locations of the recommended projects are shown in Figure 8-1.

TABLE 8-5

### EXPANSION TRANSIT PROJECTS IN THE RECOMMENDED PLAN, WITH COSTS

	2012-2015	2016-2020	2021-2025	2026-2030	2031-2035	NON-MPO TRANSIT FUNDS	MPO HIGHWAY FUNDS
<b>ONGOING NO-BUILD TRANSIT PROJECTS</b>							
Fairmount Line Improvements Project (Boston)	\$54,100,000					\$54,100,000	
1,000 New Parking Spaces (Regionwide)	\$32,000,000					\$32,000,000	
Assembly Square Orange Line Station (Somerville)*	\$50,000,000					\$35,000,000	\$15,000,000 (X) from highway funding
<b>RECOMMENDED TRANSIT PROJECTS</b>							
Red Line–Blue Line Connector – Design Only (Boston)**	\$49,000,000					\$49,000,000	
Green Line Extension from Lechmere Station to Medford Hillside (College Avenue)/Union Square (Cambridge and Somerville)*	\$476,200,000	\$643,800,000				\$1,120,000,000	
Green Line Extension from Medford Hillside (College Avenue) to Mystic Valley Parkway (Somerville and Medford)		\$185,031,000 (X) from highway funding					\$185,031,000
Russia Wharf Ferry Terminal (Boston)***	\$2,200,000					\$2,200,000	
Additional Parking Spaces in Beverly and Salem	\$50,000,000					\$50,000,000	
<b>TOTAL</b>	<b>\$823,954,000</b>	<b>\$533,346,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,342,700,000</b>	<b>\$200,300,000</b>

X indicates that highway funding is flexed to transit.

\* Assembly Square Orange Line Station - \$35,000,000 is from non-MPO revenues, including federal aid and state earmarks, and other state, local, and private funds. \$15,000,000 was flexed from MPO highway funding to this project.

\*\* MassDOT made a formal request on August 1, 2011, to remove this project from the State Implementation Plan regulation. The MPO is continuing to carry this cost until this process is completed.

\*\*\* The Russia Wharf project is in the process of being reviewed by state and local agencies.



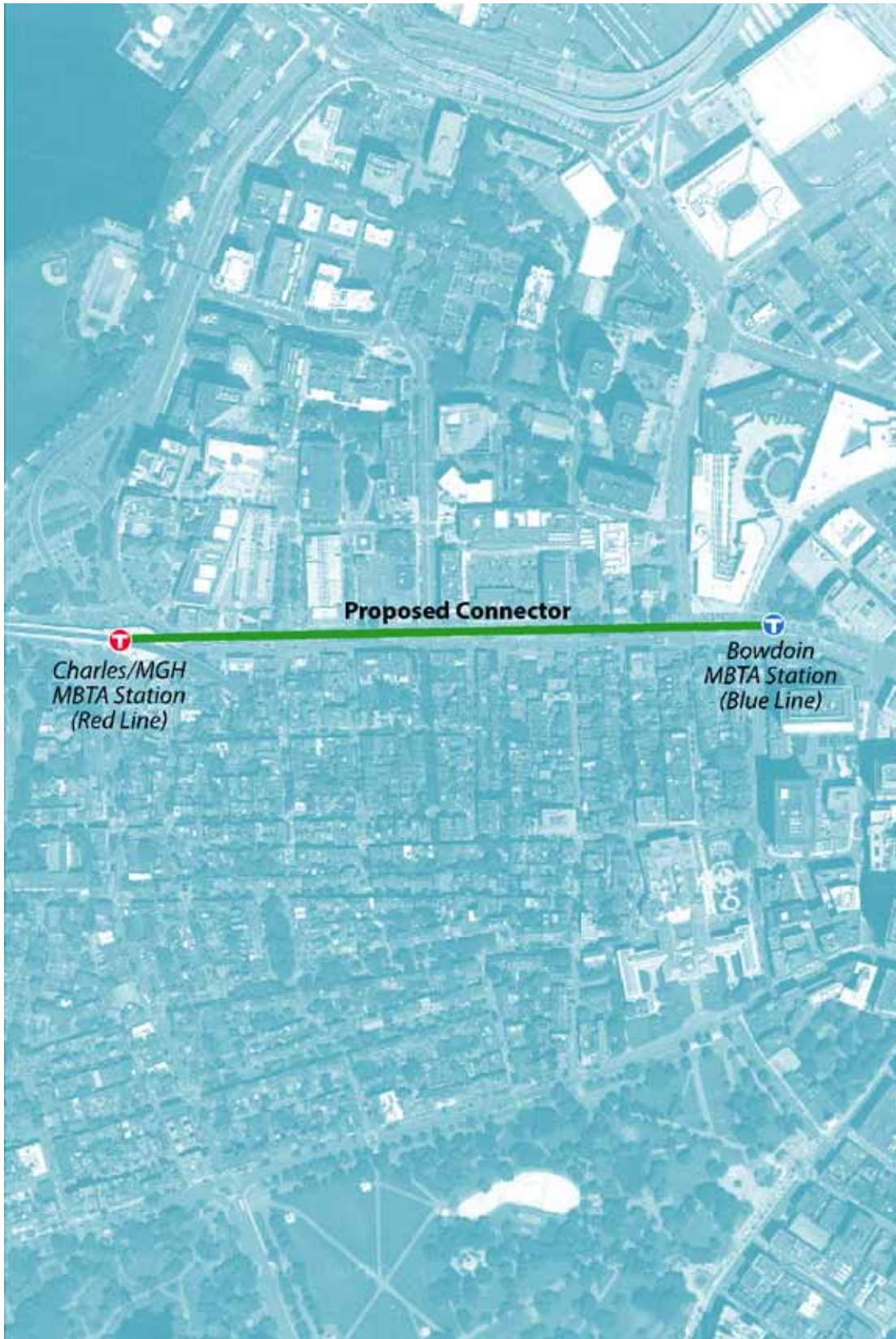
## RED LINE–BLUE LINE CONNECTOR (DESIGN ONLY) (\$49,000,000)\*

### Description

The proposed Red Line–Blue Line Connector consists of an extension of the MBTA Blue Line under Cambridge Street to the Red Line station at Charles/MGH. As currently envisioned, the project would consist of two major components: 1) a new tunnel extending the Blue Line under Cambridge Street from Joy Street to Charles Circle, and 2) a new underground Blue Line station connected to the existing Charles/MGH station. The project will also consider whether and how to make use of the existing Bowdoin Station, which will require significant rehabilitation, possibly including the relocation of underground track and platforms.

The Massachusetts Department of Environmental Protection's State Implementation Plan (SIP) requires only that MassDOT complete the final design for the project. Construction of the Red Line–Blue Line Connector is not required. The SIP contains procedures and programs to monitor, control, maintain, and enforce compliance with national air quality standards.

\* MassDOT made a formal request on August 1, 2011 to remove this project from the State Implementation Plan regulation. The MPO is continuing to carry this cost until this process is completed.



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**CAMBRIDGE, SOMERVILLE, AND MEDFORD: GREEN LINE EXTENSION PROJECT (PHASE I: LECHMERE STATION TO MEDFORD HILLSIDE (COLLEGE AVENUE)/UNION SQUARE – \$1,120,000,000; PHASE II: MEDFORD HILLSIDE (COLLEGE AVENUE) TO MYSTIC VALLEY PARKWAY/ROUTE 16 – \$140,608,000)**

**Description**

This project, the purpose of which is to improve corridor mobility, boost transit ridership, improve regional air quality, ensure equitable distribution of transit services, and support opportunities for sustainable development, will extend the MBTA Green Line in two separate phases. Phase I will extend the Green Line from a relocated Lechmere Station in East Cambridge to Medford Hillside (College Avenue) in Medford, with a branch to Union Square in Somerville. Phase II will further extend the Green Line from Medford Hillside (College Avenue) to Mystic Valley Parkway (Route 16) at the Somerville/Medford municipal boundary.

**Phase I**

Lechmere Station to Medford Hillside (College Avenue) with a branch to Union Square (State Implementation Plan commitment)

**Proposed Stations**

New Green Line stations are currently proposed for:

- College Avenue, Medford – Located at the intersection of College Avenue and Boston Avenue in Medford, adjacent to Tufts University. The station platform will be located on the north side of the College Avenue bridge, which crosses over the MBTA Lowell Line. Access to the station will be provided from both Boston Avenue and College Avenue, as well as from the Burget Avenue neighborhood, which lies northeast of the station site.
- Broadway/Ball Square, Medford/Somerville – Located at the intersection of Broadway and Boston Avenue on the north side of Ball Square. The station platform will be located on the north side of the Broadway bridge, which crosses over the MBTA Lowell Line. Access to the station will be provided from both Boston Avenue and Broadway. An electrical substation, needed to support the Green Line Extension, will likely be installed at this location.
- Lowell Street, Somerville – Located at the Lowell Street Bridge, which crosses over the MBTA Lowell Line adjacent to the proposed extension of the Somerville Community Path. The station platform will be located on the north side of the Lowell Street Bridge. Access to the station will be provided from Lowell Street.
- Gilman Square, Somerville – Located in the vicinity of the Medford Street crossing of the MBTA Lowell Line, behind Somerville’s City Hall, Public Library, and High School. The station platform will be located on the north side of the Medford Street bridge, which crosses over the MBTA Lowell Line. Access to the station will be provided from Medford Street. The proposed extension of the Somerville Community Path will be located in close proximity to the station.



## **CAMBRIDGE, SOMERVILLE, AND MEDFORD: GREEN LINE EXTENSION PROJECT (PHASE I: LECHMERE STATION TO MEDFORD HILLSIDE (COLLEGE AVENUE)/UNION SQUARE – ; PHASE II: MEDFORD HILLSIDE (COLLEGE AVENUE) TO MYSTIC VALLEY PARKWAY/ ROUTE 16 (CONT.)**

- Washington Street, Somerville – Located within the footprint of the Washington Street bridge, proximate to Somerville’s Brickbottom, Inner Belt, and Cobble Hill areas. The station platform will be located south of the Washington Street undergrade crossing of the MBTA Lowell Line. Access to the station will be provided via entrances located under or adjacent to the south abutment of the bridge, in conjunction with improved sidewalk and street crossings in the area. The proposed extension of the Somerville Community Path will be located in proximity to the station.
- Union Square, Somerville – Located east of Prospect Street in the vicinity of Union Square in Somerville. The station platform will be located within the MBTA Fitchburg Line right-of-way east of Prospect Street. Access to this station will be provided from both the street and bridge levels of Prospect Street.

Details of the design of the stations, including the relationship of the stations to the pedestrian, bicycle, and bus networks around them, are being more fully developed. The MBTA is engaging the public in developing the “look and feel” of the stations and the areas around the stations.

### **Vehicle Storage and Maintenance Facility**

The Green Line Extension will also require the construction of a new light rail vehicle storage and maintenance facility in the vicinity of the Green Line Extension. MassDOT has identified a location known as “Option L” in the Inner Belt area of Somerville as its preferred alternative for the location of the vehicle support facility. The MBTA is currently working on the program and design of the maintenance facility and its associated vehicle storage areas. The MBTA must acquire certain parcels of private property in order to construct the vehicle facility at the Option L location.

### **Phase II**

#### **Medford Hillside (College Avenue) to Mystic Valley Parkway (Route 16)**

This project is not part of the State Implementation Plan commitment. The Boston Region Region MPO members think that this is an important project and voted to include this phase in the Recommended Plan by flexing highway funding to this transit project. Design has not yet proceeded for this project. The terminus would be a station at Mystic Valley Parkway (Route 16).

**MAP 8-20**

**CAMBRIDGE, SOMERVILLE, AND MEDFORD: GREEN LINE EXTENSION PROJECT (PHASE I: LECHMERE STATION TO MEDFORD HILLSIDE (COLLEGE AVENUE)/UNION SQUARE – ; PHASE II: MEDFORD HILLSIDE (COLLEGE AVENUE) TO MYSTIC VALLEY PARKWAY/ROUTE 16**





**BOSTON: FERRY EXPANSION – RUSSIA WHARF/SOUTH STATION (\$2,200,000)**

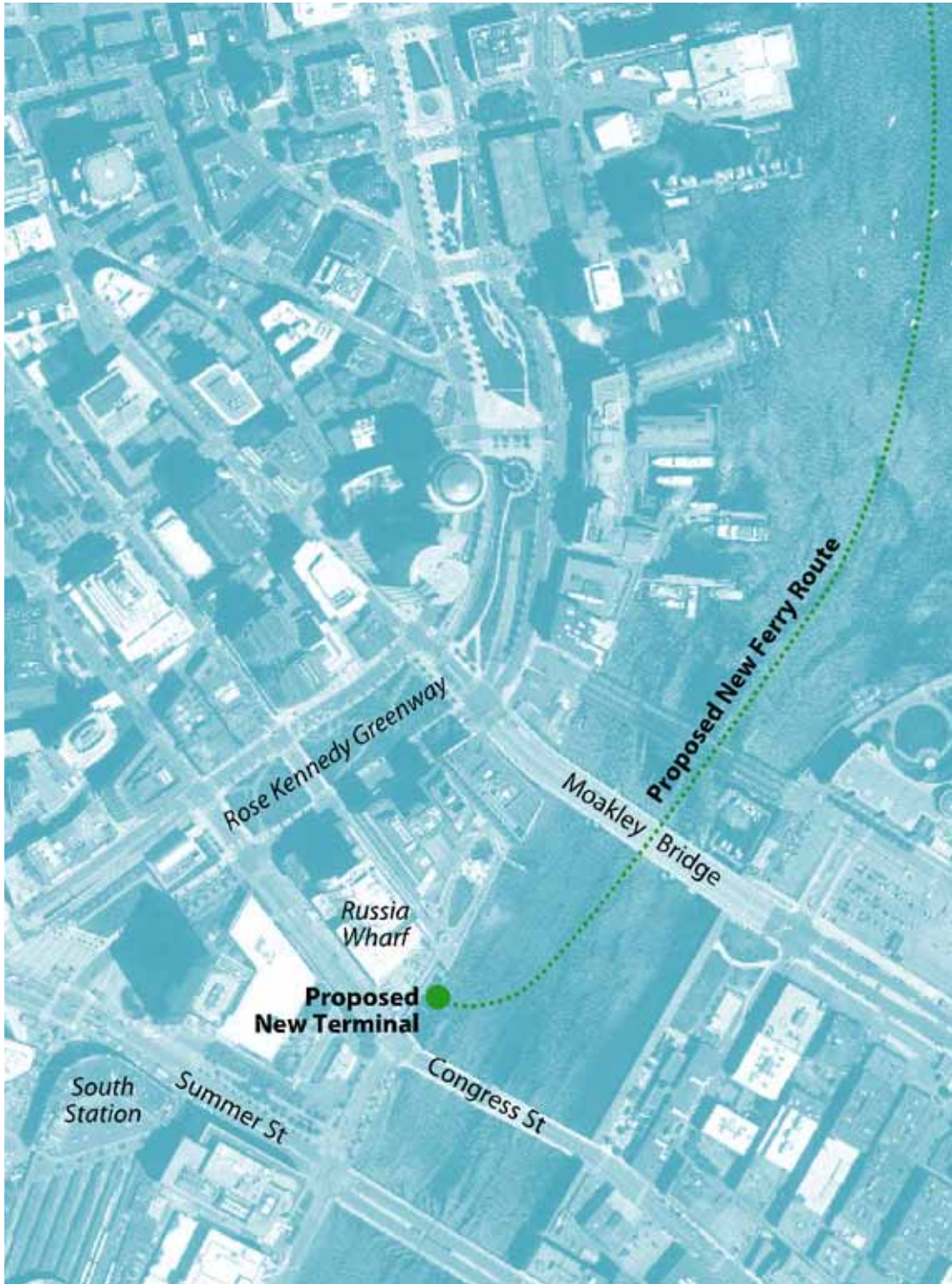
**Description**

This project will consist of implementing a new ferry route in Boston Inner Harbor, from the existing terminal at the Charlestown Navy Yard to a new terminal at Russia Wharf, which is located in Fort Point Channel at Congress Street. The construction at Russia Wharf is a CA/T legal commitment.

**Note**

The cost includes the construction of Russia Wharf (\$2,200,000). The legal commitment of the Commonwealth is only the construction of the wharf. The Boston Region MPO is carrying the cost of the Wharf in the expansion category. Service will be provided by others.







## BEVERLY AND SALEM: ADDITIONAL PARKING SPACES (\$50,000,000)

### Description

The MBTA will construct additional parking spaces at the MBTA stations in Beverly and Salem to encourage commuters and other travelers to make use of the public-transit network for trips into downtown Boston and other locations, as appropriate. Both locations are among the top three highest ridership stations within the MBTA commuter rail systems.

#### *Beverly Depot Station Parking Garage*

A new commuter parking garage adjacent the existing Beverly Depot Station, which is located in downtown Beverly, will be constructed. The garage will include approximately 500 spaces for the exclusive use of MBTA commuter parking, and may also incorporate an additional 150 spaces to support a future transit-oriented development (TOD) to be considered for development in the future.

In addition to the parking garage, an at-grade, covered pedestrian connector along the MBTA right-of-way will be constructed to provide a safe, secure, and accessible connection to the existing station platform at the Depot. The project will also include pedestrian enhancements and a streetscape on the public walkways that connect to the station, as well as some level of site improvements to the portions of the site that will be reserved for the future development.

The parking structure will be designed and engineered to accommodate an additional level of transit-oriented uses that might be built on top of the parking structure as part of the future TOD development, such as apartments or other residential units. As part of this project, infrastructure pathways and utility distribution corridors will be incorporated to simplify the task of constructing the future development that will be integrated into the project site.

#### *Salem Intermodal Parking Expansion*

The MBTA is advancing the design and construction of a structured parking facility at Salem Station. This station is located at the north end of Washington Street and serves as a gateway to historic downtown Salem. The station is also an important bus hub, with seven MBTA bus routes providing service.

The existing surface parking available at the MBTA parcel is 340 MBTA commuter spaces. (The abutting surface lot operated and maintained by the City provides another 120 spaces, which are used primarily by commuters.) The proposed parking garage will have approximately 750 spaces. This project will also include station modernization and accessibility enhancements.

**MAP 8-22**

**BEVERLY AND SALEM: ADDITIONAL PARKING SPACES**



## PROJECTS INCLUDED IN OTHER MPO AREAS

The Boston Region MPO has included a section in its LRTP identifying additional projects that are funded in other MPO areas that affect travel within the Boston region. A list of these projects, with the time frame of construction, is shown in Table 8-6. The MPO has also included these projects in the travel demand model for air quality conformity purposes. A brief description of each project and its costs for the time period of construction is also provided.

TABLE 8-6

### PROJECTS INCLUDED IN OTHER MPO AREAS AND ENDORSED BY THE BOSTON REGION MPO

RESPONSIBLE MPO	PROJECT NAME	TIMEFRAME OF CONSTRUCTION
Merrimack Valley MPO	Lowell Junction Interchange	2030–2035
Montachusett MPO	Fitchburg Commuter Rail	2012–2015
Central Mass. MPO	Interchanges at I-495/I-90 and I-495/Route 9	2021–2025

## WILMINGTON, TEWKSBURY, AND ANDOVER: LOWELL JUNCTION

### Description

This project includes constructing a new highway interchange on Interstate 93 between Exit 42 (Dascomb Road) and Exit 41 (Route 125). The new interchange will provide improved access from Interstate 93 to the industrial and office properties in the Lowell Junction area (at the Tewksbury-Wilmington border). The project will also include the construction of a connection to a planned extension of Burt Road to Ballardvale Street and the widening of I-93 to four lanes in each direction from the existing lane drop at the Wilmington-Tewksbury line to the Shawsheen River just south of Exit 42 in Tewksbury.

### Project's Context/Possible Impacts, by Relevant MPO Policy Area

#### Land Use

The area of the proposed interchange is located at the intersection of the towns of Andover, Wilmington, and Tewksbury. Land use in the area of the proposed interchange in Andover is currently zoned for industrial use. Land in the study area in Wilmington is also zoned as industrial, while land in Tewksbury is zoned as both residential and industrial.

Some of the land near the proposed interchange is available for future development, while the remainder is subject to absolute development constraints, according to the Executive Office of Environmental Affairs and the Metropolitan Area Planning Council's buildout analysis. However, the three communities have embarked on a cooperative effort to explore a new, unified land use development plan in the area that is consistent with the Commonwealth's sustainable development goals. This approach has been undertaken because officials in each community have recognized the development opportunities that construction of an interchange will bring to the area, and have concluded that establishing a coordinated land use plan will maximize the benefit that each community would receive from the project.

In support of this effort, the communities have hired a consultant to assist them in developing a shared community vision of the area, with the goal of developing "a broad policy statement of the type and character of development which each of the three communities wishes to achieve; the underlying community benefits and impacts that each wishes to manage; and the means by which to achieve these goals."<sup>1</sup> The consultant team is currently working with the Junction Route 93 Development Area Task Force to define alternative land use concepts for the area with the intent of identifying a preferred development scenario.

#### Safety

Because this is a new interchange that has not yet been constructed, there are no crash data for this project.

<sup>1</sup> The Junction Route 93 Development Area in Andover, Tewksbury, and Wilmington, Massachusetts Letter of Agreement

## WILMINGTON, TEWKSBURY, AND ANDOVER: LOWELL JUNCTION (CONT.)

### *Mobility*

According to MassDOT's traffic volumes data for the commonwealth, average daily two-way traffic on Interstate 93 north of Route 62 in Wilmington was 154,900 in 2004.

Average observed travel speeds on roadways are compiled in the MPO's Congestion Management Process. Average observed speeds on Interstate 93 North at the location of the proposed interchange are 60 mph or greater during the AM and PM peak periods. Average observed speeds on Interstate 93 South at the location of the proposed interchange are 30–44 mph during the AM peak period (meeting the CMP's congestion threshold), and 60 mph or greater during the PM peak period.

According to the Lowell Junction Interchange Study conducted by Vanasse Hangen Brustlin Inc. in 2006, significant congestion occurs at both the Route 125 and Dascomb Road interchanges with I-93. Access to Lowell Junction is via local roadways that connect to these interchanges. Analyses performed at intersections in the study area indicate the following:

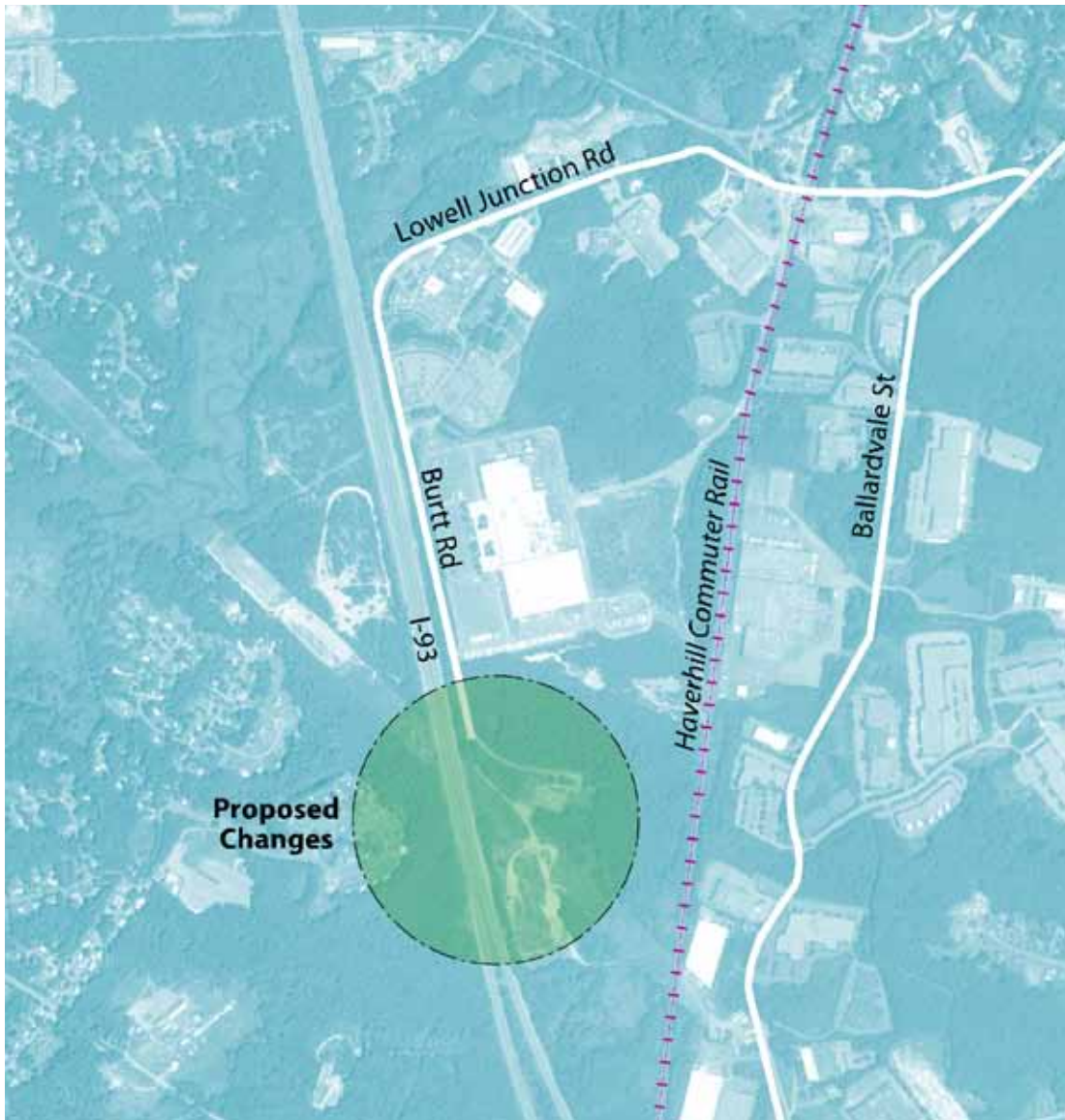
- Route 125/Ballardvale Street operates at a deficient level of service during both peak periods. Interim improvements to this intersection and the surrounding area were included in the 2004 Boston Regional Transportation Plan.
- Dascomb Road intersections with Frontage Road and Lovejoy Road operate at an acceptable level of service (LOS) during both peak periods.
- Analyses of unsignalized intersections performed at eight study-area locations indicate that all four intersections at the I-93 ramps (Exits 41 and 42) experience level of service (LOS) E or F for side-street traffic during both peak periods. Three of the local intersections experience LOS F during the PM peak and one operates at LOS F during the AM peak. Only one intersection operates at an acceptable LOS during both peak periods.

### *Connectivity*

The proposed interchange will improve access to industrial and office properties in the Lowell Junction area from I-93. The MBTA's Haverhill commuter rail line runs near the location of the proposed interchange. The communities of Andover, Tewksbury, and Wilmington have embarked on a joint planning effort to develop a coordinated land use and development plan for the area. One of the land use scenarios now being considered calls for the construction of a commuter rail stop near the new interchange, but there are no plans for a new station in the area at this time.

### *Economic Opportunities*

The addition of the interchange will provide improved access to the existing industrial and commercial developments in the Lowell Junction area. It will also expand the economic base of the area by providing access to currently undeveloped land that is zoned for industrial and commercial use on both the east and west sides of I-93. Implementation of a sustainable-growth land use plan for the area could substantially



increase the level of benefit that this project could provide to the three communities and to the commonwealth.

**Note**

The Merrimack Valley MPO is responsible for including the funding for this project in their transportation plan. At this time, they are projecting that the project will be completed by 2035. The Boston Region MPO and Northern Middlesex MPO will list this project in their Long-Range Transportation Plans because the project has portions in all three MPO areas.

## FITCHBURG: COMMUTER RAIL (\$200,000,000)

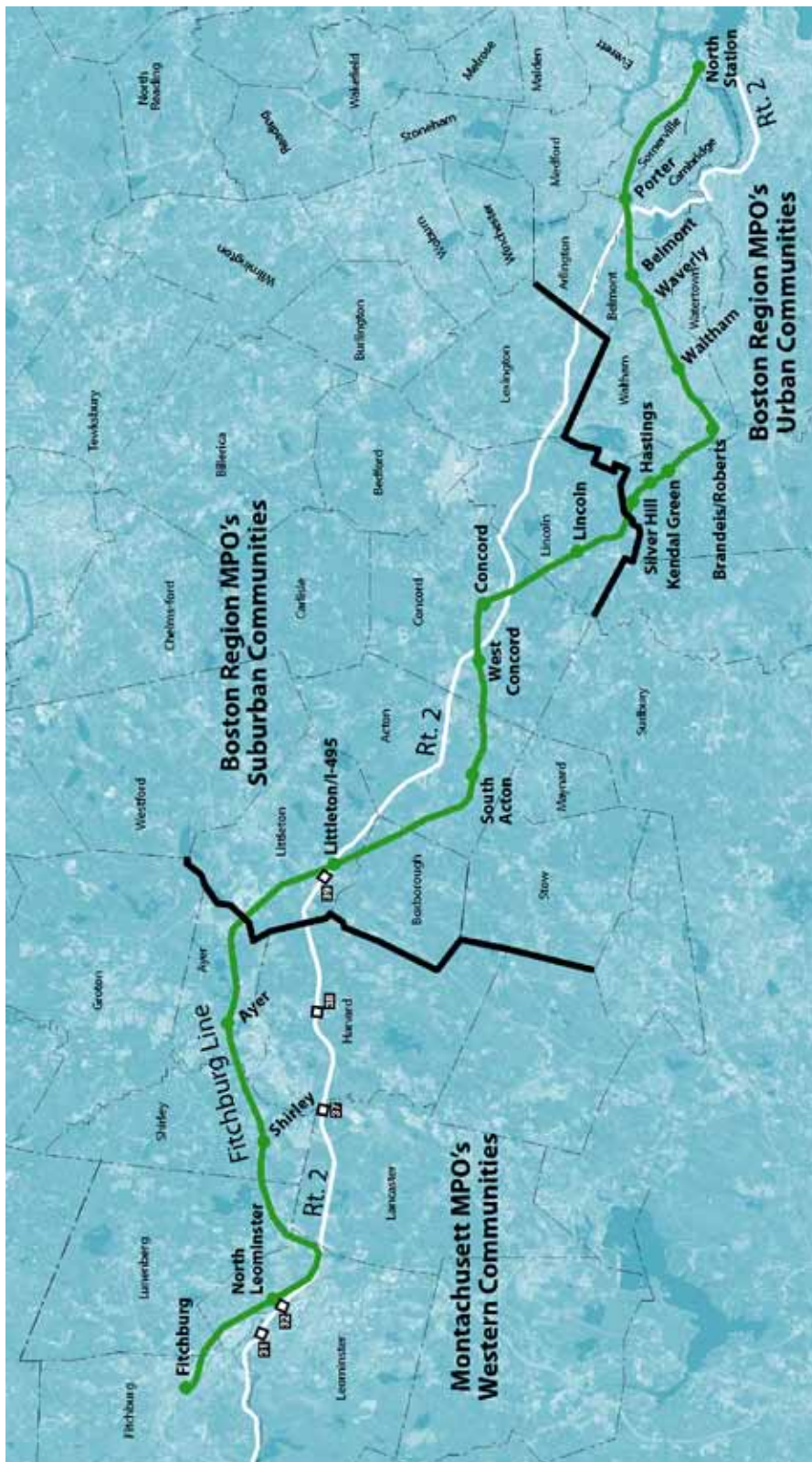
### Description

Improvements will be made along the Fitchburg commuter rail line to reduce the travel time between Fitchburg and Porter Square, in Cambridge, to one hour or less. The existing stations will remain and no new stations will be added. Improvements will include:

- Install Fiber-Optic Cable from West Acton to Somerville
- Replace Wayside Signal System with in-cab system from West Acton to Somerville
- Construct nine new/reconfigured crossovers and interlockings and retire existing
- Reinstall double track from Ayer to West Acton
- Construction/realignment of track through Willows to Ayer
- Construct Center High Level Platforms at South Acton as part of station reconstruction
- Reconstruction of seven bridges







## HOPKINTON, SOUTHBOROUGH, AND WESTBOROUGH: INTERCHANGES AT INTERSTATE 495/INTERSTATE 90 AND INTERSTATE 495/ROUTE 9 (\$25,310,000)

### Description

The interchanges at Interstate 495/Interstate 90 and Interstate 495/Route 9 are currently under study by MassDOT to analyze their existing and future safety and capacity deficiencies. The 495/MetroWest Partnership (formerly the Arc of Innovation) identified these two interchanges as two of the 495 MetroWest corridor's top ten traffic nightmares, which was updated in 2007. The limits of the study along I-495 extend from one mile north of Route 9 to one mile south of I-90. On Route 9, the study extends from one mile west of I-495 (including the interchange ramps at Route 9/Computer Drive/Research Drive) to one mile east of I-495. On I-90, the study extends from one mile west of I-495 to one mile east of I-495.

### Project's Context/Possible Impacts, by MPO Policy Area

#### Safety

Between 2006 and 2008, the I-495/I-90 interchange was the site of 206 crashes, of which 155 involved only property damage and 51 involved bodily injuries, with one fatality. During that same period, the I-495/Route 9 interchange was the site of 102 crashes, of which 75 involved only property damage and 27 involved bodily injuries, none with fatalities. The I-495/I-90 interchange is also one of the top truck-crash locations in the Boston region. It handles many of the trucks traveling through the region between northern and southern New England.

#### Mobility

According to MassDOT traffic count data, the average daily traffic on I-495 and I-90 near this interchange data is as follows:

Interstate 90:

- Between Exits 11 and 11A (west of the interchange) – 89,200 (2006 counts)
  - Approximately 12 percent of traffic is large trucks
- Between Exits 11A and 12 (east of the interchange) – 94,200 (2006 counts)
  - Approximately 7 percent of traffic is large trucks

Interstate 495:

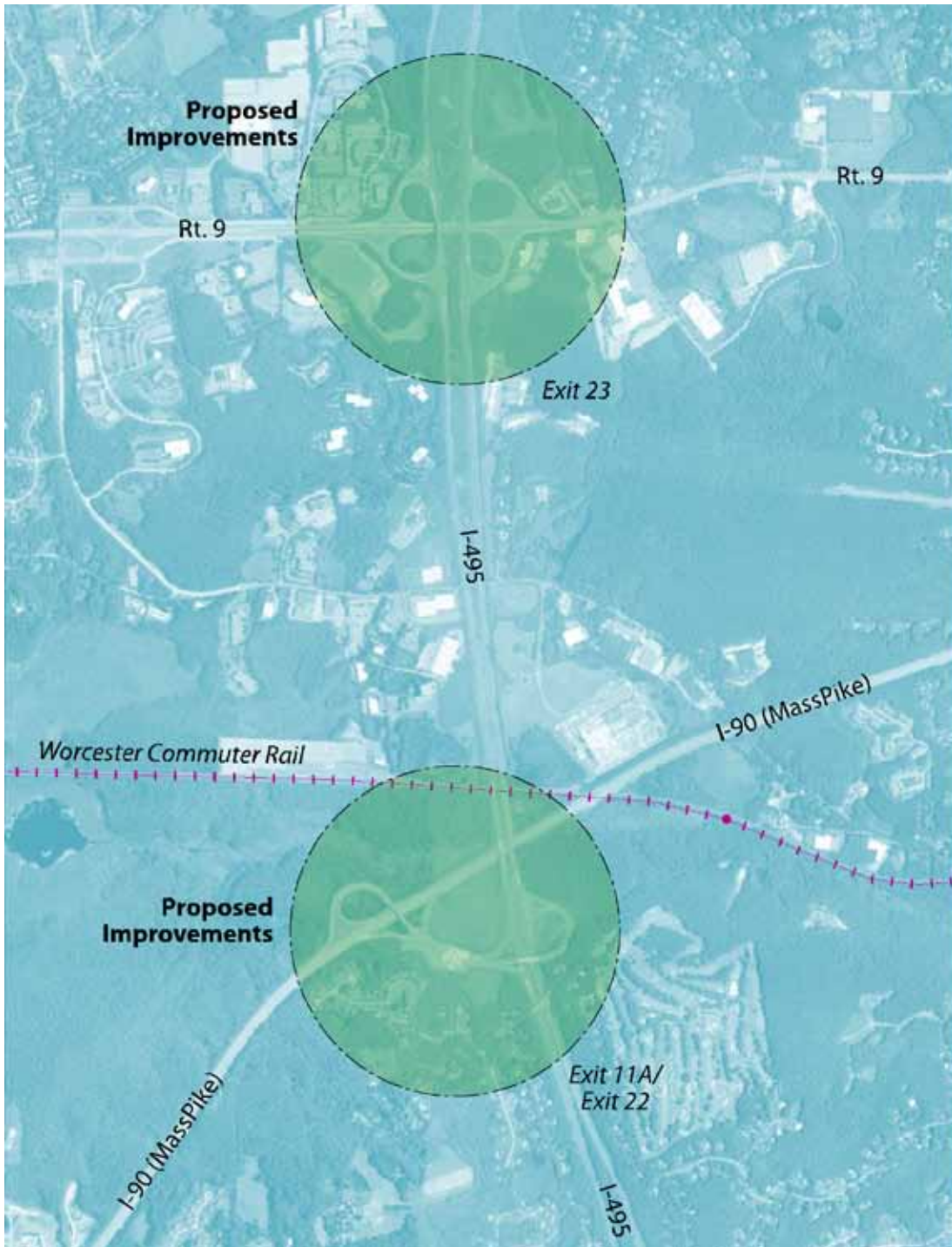
- South of Route 9 (north of interchange) – 92,100 (2006 counts)
- South of I-90 – 98,900 (2004 counts)

According to MassDOT traffic count data, the average daily traffic on I-495 and Route 9 near this interchange is as follows:

Interstate 495:

- South of Route 9, Westborough – 92,100 (2006 counts)

**MAP 8-25 HOPKINTON, SOUTHBOROUGH, AND WESTBOROUGH: INTERCHANGES AT INTERSTATE 495/INTERSTATE 90 AND INTERSTATE 495/ROUTE 9**



Route 9:

- East of Route 30, Westborough (west of the interchange) – 53,000 (2004 counts)
- West of Woodland Road, Southborough (east of the interchange) – 49,100 (2004 counts)

## MODEL RESULTS AND INTERPRETATION OF THE RECOMMENDED PLAN

The travel demand model set used in the analysis for this LRTP is based on the traditional four-step urban transportation planning process of trip generation, trip distribution, mode choice, and trip assignment. It reflects existing travel conditions and forecasts future-year travel on the entire eastern Massachusetts transit and highway system. This eastern Massachusetts region includes an additional 63 communities outside of the 101-municipality Boston Region MPO area, including communities east of Worcester, north to the New Hampshire border, and south into portions of Bristol and Plymouth counties. This area, which is larger than the Boston Region MPO area, is used in order to capture a more accurate picture of the travel demands within the region. The travel demand model set is employed to estimate weekday transit ridership, highway traffic volumes, and nonmotorized travel (walking and bicycling), primarily on the basis of forecasts of study-area demography and projected highway and transit improvements. The model set uses the best component models, networks, and input data available to MPO staff at this time. See more detailed information on the travel demand model in Appendix C.

### 2009 Base-Year Scenario

The travel demand model uses the year 2009 as a starting point for model analysis. This is the latest year for which the MPO has a depth of reliable data for model inputs. The 2009 Base Case consists of those major roadway and transit projects that were built and opened for public use by April 2009. Those projects' attributes were coded into the model's transportation network representation to serve as the base, or starting point, for analysis. An existing-conditions network was calibrated to reflect year 2009 travel conditions.

### Future-Year Land-Use Scenario

The future-year land-use scenario is based on inputs from two sources. For the 101 cities and towns within the Boston Region MPO area, the MPO adopted the Metropolitan Area Planning Council (MAPC) land use scenario referred to as MetroFuture. The demographic data for this land-use scenario were also developed by MAPC, and allocate forecasts of population, households, and employment by transportation analysis zone (TAZ) out to the year 2035. Some of the attributes of this scenario are:

- More new population growth would occur in the Inner Core and Regional Urban Centers.
- More new jobs would be located in the Inner Core or Regional Urban Centers.
- Two-thirds of new suburban housing growth would be in or near town centers and existing commercial areas.
- Most new suburban housing would be created through redevelopment.
- The region would build more starter homes for young families, and more apartments and condominiums for the elderly and empty nesters, helping to retain two demographic cohorts that have high rates of out-migration.

- Investments in public education, community colleges, and job training would help to increase the skill level of the local workforce, fostering economic development.

For the 63 communities that are located outside of the Boston Region MPO area, the MPO agreed to use the forecasts from the neighboring regional planning agencies. The resulting combined demographic dataset is referred to as the Regional Planning Agency (RPA) Hybrid Scenario. For this hybrid scenario, the population in this region is projected to increase by 11.8 percent between 2009 and 2035. During the same time period, employment is projected to grow by 8.8 percent. The households are projected to increase by 13.7 percent, whereas the average household size is projected to decrease from 2.50 persons in the Base Year to 2.46 in year 2035.

## Future-Year Transportation Alternatives

The travel model analysis for the LRTP consists of analyzing first the future-year No-Build transportation alternative, followed by analyzing the “Build” transportation alternative, which is with the Recommended Plan. The demographic dataset stays constant, but the distributions of trip flows vary as a result of different transportation network investments.

### 2035 No-Build Network

The No-Build network consists of: 1) all the projects that make up the Base Year network, 2) those that have already been built since year 2009 and are in operation, and 3) those projects that the MPO felt were far enough along in the programming and construction process to be considered implemented. Major highway and transit projects that are part of the 2035 No-Build network are listed in Appendix C.

### Build (Recommended Plan) Network

The Build network consists of the highway and transit projects selected for construction in this LRTP, and described earlier in Chapter 8 and in Table 8-3, in addition to what is assumed for the No-Build network.

## Travel Model Results

The results of the travel model runs provide information about how the transportation system is likely to be used in the future and also estimates the impact that the Boston Region MPO’s investments will have on travel patterns. The model results forecast the following metrics across the 2009 Base Year, 2035 No-Build Scenario, and 2035 Recommended Plan Scenario:

- Daily linked trips, by mode (auto, transit, and nonmotorized)
- Average daily unlinked transit ridership by mode (bus, subway, commuter rail, etc.)
- Total vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT) on a typical weekday

The 2035 demographic forecasts projected growth in the number of employees and residents in Eastern Massachusetts. This projected increase in activity from growth in households and employment relates closely with the increase in total trips. As a result of the high percentage change in population (11.8 percent), households (13.7 percent),

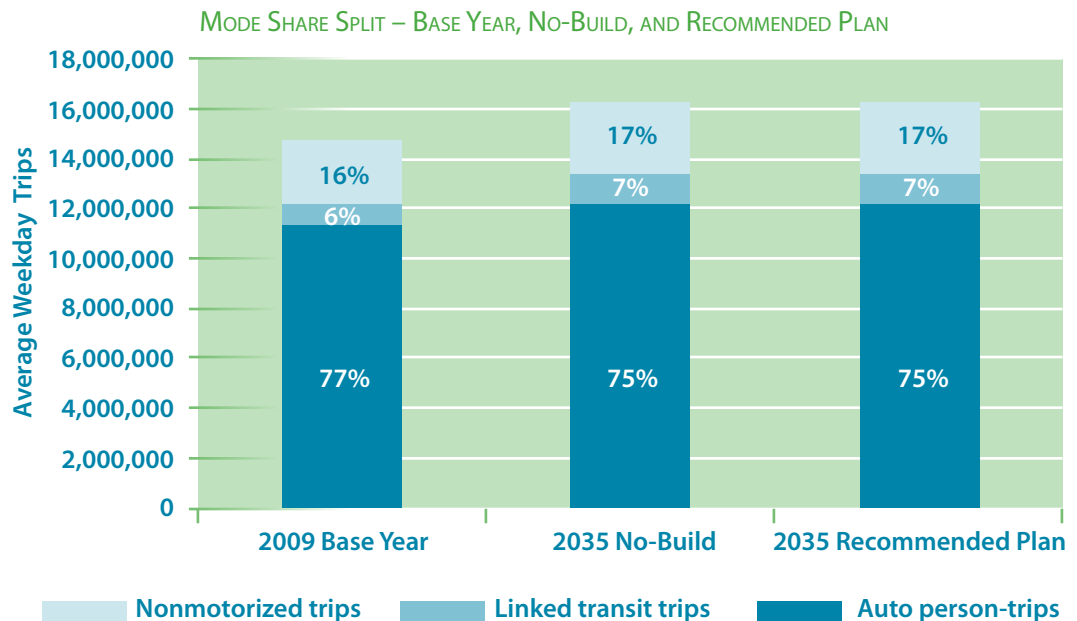
and employment (8.8 percent) in this region, the number of total trips on an average weekday, regardless of mode, is estimated to increase from nearly 17.0 million trips in 2009 to approximately 19.0 million trips in 2035. This represents an 11.7 percent increase, or an average annual growth through 2035 of almost 0.5 percent.

The assumed level of economic growth leads to significant increases in the number of trips produced within and attracted within the region on an average weekday. The biggest increase in trips is expected in the Inner Core and the outer portions of the region. External stations (points of entry into and exit from the modeling region) see a substantial increase (25.5 percent) in the number of trips.

In addition to the increase in total person-trips to the region, there are also likely to be slight changes in mode choice between the 2009 Base Year and the 2035 No-Build scenarios. Transit and nonmotorized trips are expected to grow faster than auto trips. Transit trips are projected to have the greatest increase, from 899,100 trips in 2009 to 1,169,300 trips in the 2035 No-Build scenario (30 percent). Nonmotorized trips are estimated to increase by almost 17 percent, from 2.42 million trips in 2009 to 2.84 million trips in the 2035 No-Build scenario. Trips made by auto show a lower percentage increase, of just over 7 percent, as it grows from 11.39 million trips in 2009 to 12.21 million trips in the 2035 No-Build scenario.

Figure 8-2 that shows the change in the share of auto, transit, and nonmotorized trips in the Base Year, No-Build, and Recommended Plan scenarios. It indicates that as transit and nonmotorized trips grow faster than auto person-trips, they will make up a slightly greater percentage of total trips in the 2035 No-Build and Recommended Plan scenarios. This growth in transit is a result of a greater concentration of activity near transit service, and locating complementary land uses together to increase walking and bicycling trips.

FIGURE 8-2



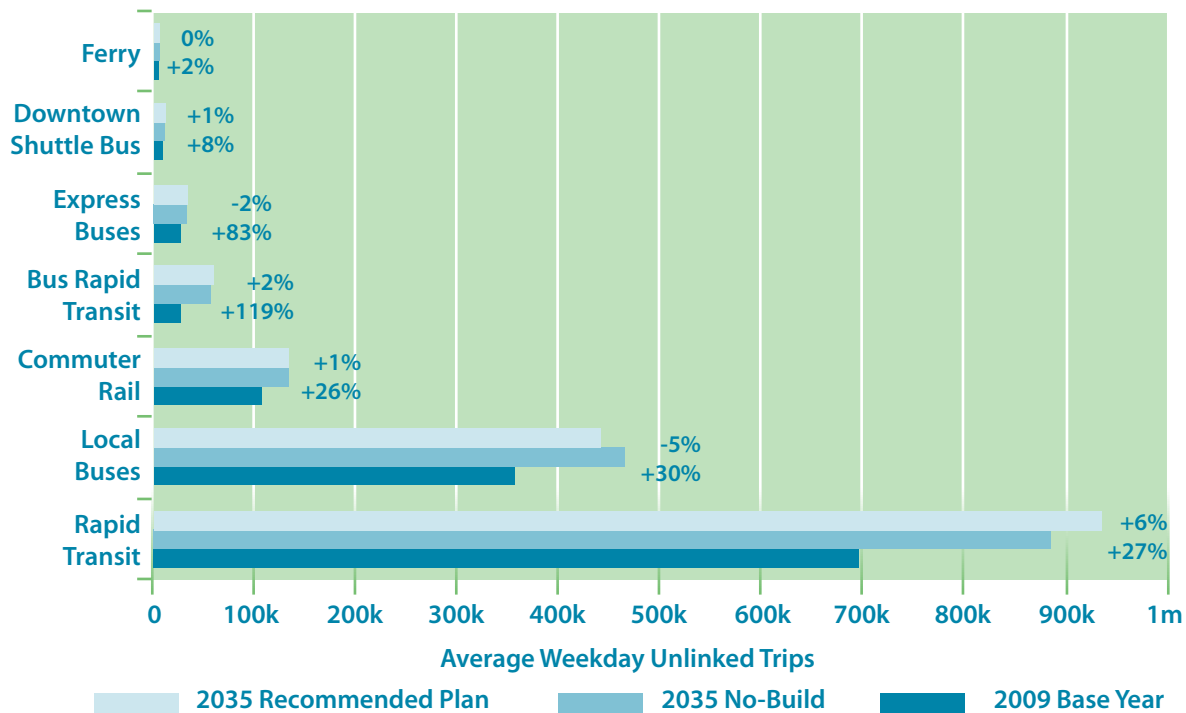
## Transit

To determine the true level of transit demand, both in absolute value and spatial distribution, given the underlying population/household and employment projections, the transit ridership forecasts from the transit portion of the overall travel-forecasting model have not been constrained by transit service capacity.

Observed data indicate that there were approximately 899,100 linked transit trips on a typical weekday in 2009. In the 2035 No-Build, the number of linked transit trips is projected to reach about 1.2 million trips, a 30 percent increase.<sup>2</sup> This increase is a result of two factors: growth in demographics (which has a major impact, as discussed above) and changes to the transportation system (ex. Fairmount Corridor Improvements and Fitchburg Line Improvements) that shift more people onto transit from other modes, such as the auto and nonmotorized modes. The unlinked transit trips are estimated to increase from 1.22 million in 2009 to 1.58 million in the 2035 No-Build scenario, a 30 percent increase.<sup>3</sup> Figure 8-3 shows how these additional trips are expected to be taken across the various transit modes. The bottom percentages indicate the change in unlinked trips from the 2009 Base Year to the 2035 No-Build, and the top percentages indicate the change between the 2035 No-Build and the 2035 Recommended Plan.

FIGURE 8-3

### UNLINKED TRANSIT TRIPS BY MODE



<sup>2</sup> Linked trip: a trip from origin to destination on the transit system. Even if a passenger must make several transfers during a journey, the trip is counted as one linked trip on the system.

<sup>3</sup> Unlinked trip: any segment of a linked trip. The number of passengers who board public transportation vehicles.

The number of unlinked trips on the rapid transit system is projected to grow by 189,100 trips (27 percent) in the 2035 No-Build scenario. The majority of this increase is related to demographic growth. Local bus trips are also projected to have a substantial increase, approximately 105,600 trips (30 percent). Most of this increase is tied to demographic growth. Commuter rail is expected to increase by 26,800 trips (26 percent) in the 2035 No-Build scenario. This is likely the result of the added/improved Fairmount Line and Fitchburg Line service, in addition to growth of demographics, and future traffic congestion favoring commuter rail over the auto mode. Bus-rapid-transit (BRT) is likely to add 30,500 trips (119 percent) in the 2035 No-Build scenario, due to operation of Silver Line Four (SL4) that commenced in September 2009. Unlinked trips on the express bus system are projected to increase by 5,700 trips (23 percent), and the downtown shuttle bus system is expected to add 100 trips in the 2035 No-Build scenario.<sup>4</sup> Ferry service shows little change. One possible reason is that the Greenbush commuter rail line hugs the coast and is located near several ferry services. This may siphon off some of the potential ferry users to commuter rail.

The 2035 Recommended Plan scenario helps to identify the impacts that the region's transportation investments have on the system. For transit, the 2035 Recommended Plan adds approximately 32,000 (2 percent) new unlinked transit trips to the system. The largest change would be almost 52,000 new unlinked trips to the rapid transit system, an increase of 6 percent. This increase is primarily related to the construction of the Green Line Extension (Lechmere to College Avenue and College Avenue to Mystic Valley Parkway plus Union Square) and partially to the completion of the Beverly and Salem garages. A significant portion of these new rapid transit trips is expected to be siphoning off current local bus users, as local bus trips are expected to decline by approximately 21,000 trips (-5 percent) in the 2035 Recommended Plan scenario. There will also be incremental growth in bus rapid transit (1,100), commuter rail trips (800), and downtown shuttle buses (100). The addition of parking in Beverly and Salem will primarily be responsible for increases in commuter rail trips. Ferry trips will remain constant, and express bus trips will decrease by 700 trips (-2 percent).

## Highway

The model produces several metrics for measuring the highway transportation network, including vehicle trips, vehicle-miles of travel (VMT), vehicle-hours of travel (VHT), and average speed. The 2035 No-Build scenario indicates that there will be growth in vehicle trips, VMT, and VHT, resulting directly from greater motorist activity. Vehicle trips include all vehicle types, such as personal vehicles, trucks, taxis, and vehicles from outside the region. There were about 13 million vehicle trips on the average weekday using the roadway system in 2009. This number is projected to increase by 10.2 percent, to 14.1 million vehicle trips in the 2035 No-Build scenario. Similarly, auto person-trips are projected to increase by roughly 7.2 percent between the Base Year and 2035 No-Build scenario. The explanation for the total number of vehicle trips increasing more than the auto-person-trips is a greater increase in truck trips and a higher number of vehicle trips made by people traveling inside/outside of our modeled area.

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<sup>4</sup> Express buses are operated by the MBTA, Logan Express, and private carriers. Downtown shuttle buses are operated by Partners Healthcare.



Despite auto travel growing at a slower rate than that projected for transit, roadway vehicle-miles traveled (VMT) is projected to increase. The total VMT on the region's highway network is projected to increase by nearly 10,600,000 miles (9.7 percent) in 2035 under the No-Build scenario. Yet, the average trip length will likely decrease by 0.5 percent, reflecting a greater geographical concentration of activity in the 2035 No-Build scenario. Nearly all of the increase in VMT is due to projected demographic growth.

VHT is projected to increase by nearly 600,000 hours (18.7 percent) in the 2035 No-Build scenario. VHT growth is expected to increase at a faster rate than VMT because the additional traffic is causing more congestion. This also leads to lower average speeds, reflected by the 7.5 percent decrease in average speed on the highway system in the 2035 No-Build scenario.

According to the 2035 Recommended Plan, the cumulative effect of the new highway projects on auto travel is minimal (less than one percent change). It is projected that there will be a decrease of 6,600 vehicle trips from the 2035 No-Build scenario and 9,900 less VHT, yet both reductions make up less than a one percent change. Projections also forecast an increase in VMT of 56,900 miles (less than one percent). The average trip length, average travel time, and average speed remain unchanged in the 2035 Recommended Plan scenario.

### **Nonmotorized Travel**

The nonmotorized mode consists of walking and bicycling trips occurring between areas in our model area called transportation analysis zones. Between the Base Year and the 2035 No-Build scenario, this mode is projected to increase by 410,900 trips (17 percent). This increase is a function of residences being located closer to work and activities.

The 2035 Recommended Plan scenario indicates that about 12,700 trips (less than one percent) are expected to be diverted from nonmotorized modes due to improvements in transit services and highway facilities.