



LONG-RANGE TRANSPORTATION
 PLAN OF THE BOSTON REGION
 METROPOLITAN
 PLANNING
 ORGANIZATION

Volume I

September 22, 2011

The Boston Region Metropolitan Planning Organization (MPO) is composed of:

Massachusetts Department of Transportation Office of Planning and Programming

Massachusetts Department of Transportation Highway Division

Federal Highway Administration

Federal Transit Administration

Massachusetts Bay Transportation Authority

Massachusetts Bay Transportation Authority Advisory Board

Massachusetts Port Authority

Regional Transportation Advisory Council

Metropolitan Area Planning Council

City of Boston

Town of Braintree

City of Newton

City of Somerville

Town of Bedford

Town of Framingham

Town of Hopkinton

Prepared by the MPO's Central Transportation Planning Staff

This document was funded in part through grants from the Federal Highway Administration and Federal Transit Administration of the U.S. Department of Transportation. Its contents do not necessarily reflect the official views or policies of the U.S. DOT.





**BOSTON
REGION
METROPOLITAN
PLANNING
ORGANIZATION
MUNICIPALITIES**

For additional copies of this document or to request it in accessible formats, contact us:

- By mail Central Transportation Planning Staff
 Certification Activities Group
 10 Park Plaza, Suite 2150
 Boston, MA 02116
- By telephone (617) 973-7100 (voice)
 (617) 973-7089 (TTY)
- By fax (617) 973-8855
- By e-mail amcgahan@bostonmpo.org

This document can be downloaded from our Web site:
www.bostonmpo.org

The MPO fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. The MPO does not discriminate on the basis of race, color, national origin, English proficiency, income, religious creed, ancestry, disability, age, gender, sexual orientation, gender identity or expression, or military service. Any person who believes he/she or any specific class of persons has been subjected to discrimination prohibited by Title VI or related statutes or regulations may, herself/himself or via a representative, file a written complaint with the MPO. A complaint must be filed no later than 180 calendar days after the date on which the person believes the discrimination occurred. A complaint form and additional information can be obtained by contacting the MPO (see above) or at www.bostonmpo.org

TABLE OF CONTENTS

		Page
Chapter 1	Introduction and Plan Process	1-1
Chapter 2	MPO's Visions and Policies	2-1
Chapter 3	A Summary of the Region's Transportation Needs	3-1
Chapter 4	Transportation System Operations and Management	4-1
Chapter 5	Livability and Environment	5-1
Chapter 6	Transportation Equity	6-1
Chapter 7	The Financial Plan	7-1
Chapter 8	The Recommended Plan	8-1
Chapter 9	Environmental Justice Assessment	9-1
Chapter 10	Air Quality Conformity Determination	10-1
Appendix A	Public Comments	A-1
Appendix B	Universe of Projects and Programs	B-1
Appendix C	Project Descriptions for 2009 Base Year and 2035 No-Build Projects	C-1



LIST OF FIGURES, TABLES, AND MAPS

FIGURES

	Page	
1-1	The Boston Region MPO's Municipalities	1-2
4-1	Shared Use Rail Infrastructure	4-26
5-1	Flood Hazard Areas	5-4
5-2	Coastal Vulnerability to Sea Level Rise-North Shore	5-6
5-3	Coastal Vulnerability to Sea Level Rise-Central Coastal Area	5-7
5-4	Coastal Vulnerability to Sea Level Rise-South Shore	5-8
5-5	Hurricane Surge Inundation – North Shore	5-10
5-6	Hurricane Surge Inundation – Central Coastal Area	5-11
5-7	Hurricane Surge Inundation – South Shore	5-12
5-8	Areas of Environmental Concern	5-22
5-9	FEMA Q3 Special Flood Hazard Areas	5-23
5-10	Wetlands	5-24
5-11	Public Water Supplies	5-25
5-12	Surface Water Protection Areas	5-26
5-13	Protected Open Space	5-27
5-14	Natural Heritage and Endangered Species Program Priority Habitats	5-28
5-15	Annual Vehicle Miles Traveled Per Capita (1990-2008)	5-30
5-16	Transit Coverage in Relation to Population Density by Census Tract	5-33
5-17	Population Density and Vehicle Miles Traveled	5-34
5-18	Population Density and Resident Workers That Walk to Work	5-35
5-19	City of Cambridge Bicycle Network	5-43
6-1	Boston MPO Region Environmental Justice Areas	6-5
6-2	Boston MPO Region Urban Core Environmental Justice Areas	6-6
8-2	Mode Share Split – Base Year, No-Build, and Recommended Plan	8-70
8-3	Unlinked Transit Trips by Mode	8-71
9-1	Environmental Justice Population Zones –Regionwide	9-3
9-2	Environmental Justice Population Zones –Central Area	9-4
9-3	Average Transit Travel Times to Destinations for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-7
9-4	Average Highway Travel Times to Destinations for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-7

FIGURES (cont.)

	Page
9-5 Average Number of Industrial Jobs to Which There is Access for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-8
9-6 Average Number of Retail Jobs to Which There is Access for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-8
9-7 Average Number of Service Jobs to Which There is Access for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-8
9-8 Average Number of Colleges (In Terms of College Enrollment) to Which There is Access for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-9
9-9 Average Number of Hospital Beds to Which There is Access for Environmental and Non-Environmental Justice Areas in the 2035 No-Build and 2035 Build Networks	9-9
9-10 Average Transit Travel Times for Environmental and Non-Environmental Justice Zones in the 2035 No-Build and 2035 Build Networks	9-10
9-11 Average Highway Travel Times for Environmental and Non-Environmental Justice Zones in the 2035 No-Build and 2035 Build Networks	9-10
9-12 Average Congested Vehicle Miles Traveled (VMT) for Environmental and Non-Environmental Justice Zones in the 2035 No-Build and 2035 Build Networks	9-11
9-13 Average VMT for Environmental and Non-Environmental Justice Zones in the 2035 No-Build and 2035 Build Networks	9-11
9-14 Average Carbon Monoxide (CO) Emissions per Square Mile for Environmental and Non-Environmental Justice Zones in the 2035 No-Build and 2035 Build Networks	9-12

TABLES

3-1 Corridor Bottlenecks	3-4
5-1 Massachusetts Statewide CO2 Emissions and Estimates	5-16
5-2 List of Recommended Projects	5-21
5-3 Indicators of Livability Across community Types	5-34
6-1 Environmental Justice Area Demographics	6-3
7-1 Projected Sources of Funds for Capital Projects in the Boston Region MPO Highway System (In Millions)	7-3
7-2 Major Infrastructure Projects, Expansion Highway Projects, and Flex-Funded Transit Projects In the Recommended Plan	7-4



TABLES (cont.)		Page
7-3	Projected Sources of Funds for Maintenance of Highway System in the Boston Region MPO (In Millions)	7-5
7-4	Project Funding for Pavement Management of the Federal-Aid Roadway System in the Boston Region MPO Region (In Millions)	7-6
7-5	Project Operations and Maintenance Revenues of the MBTA Transit System (In Millions)	7-8
7-6	Project Operations and Maintenance Costs of the MBTA Transit System (In Millions)	7-10
7-7	Project Revenues and Costs for Operations and Maintenance Costs of the MBTA Transit System (In Millions)	7-10
7-8	Projected Funds Available for the MBTA Capital Program (In Millions)	7-11
7-9	Major Infrastructure and Expansion Transit Projects in the Recommended Plan	7-13
7-10	Projections of the Use of Transit Capital Funds (In Millions)	7-14
8-1	Major Infrastructure and Expansion Projects in the Recommended Plan	8-5
8-2	Funding Dedicated to Major Infrastructure and Expansion Projects	8-7
8-3	Major Infrastructure and Expansion Highway Projects in the Recommended Plan, With Costs	8-8
8-4	Highway Bridges With Estimated Costs over \$10 Million	8-10
8-5	Expansion Transit Projects in the Recommended Plan, with Costs	8-49
8-6	Projects Included in Other MPO Areas and Endorsed by the Boston Region MPO	8-60
10-1	Regionally Significant Projects Included in the Regional Transportation Models for the Eastern Massachusetts Ozone Nonattainment Area	10-15
10-2	Emissions from Off-Model Sources of VMT in Eastern Massachusetts	10-19
10-3	HPMS Adjustment Factors	10-20
10-4	VOC Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area (In tons per Summer Day)	10-21
10-5	NOx Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area (In tons per Summer Day)	10-21
10-6	Winter CO Emissions Estimates for the CO Maintenance Area for the Nine Cities in the Boston Area (All Emissions in In tons per Winter Day)	10-22
C-1	2009 Base Year, 2035 No-Build, and 2035 Recommended Plan Transportation Network Model Results	C-3
MAPS		
8-1	Bedford, Billerica, and Burlington: Middlesex Turnpike, Phase 3	8-13
8-2	Belmont: Trapelo Road	8-15

MAPS (cont.)		Page
8-3	Boston: Conley Terminal Dedicated Freight Corridor and Buffer Open Space	8-17
8-4	Boston: Rutherford Avenue/Sullivan Square	8-19
8-5	Braintree: I-93/Route 3 Interchange (Braintree Split)	8-21
8-6	Canton: I-95/I-93 Interchange Description	8-23
8-7	Canton: I-95 Northbound/Dedham Street Ramp	8-25
8-8	Concord to Westford: Bruce Freeman Rail Trail	8-27
8-9	Framingham: Route 126/Route 135 Grade Separation	8-29
8-10	Hanover: Route 53, Final Phase	8-31
8-11	Hudson to Acton: Assabet River Rail Trail	8-33
8-12	Malden, Revere, and Saugus: Route 1 Improvements	8-35
8-13	Needham and Newton: Needham Street/Highland Avenue	8-37
8-14	Reading and Woburn: I-93/I-95 Interchange	8-39
8-15	Salem: Bridge Street	8-41
8-16	Weymouth: Route 18 Capacity Improvements Project	8-43
8-17	Woburn: Montvale Avenue	8-45
8-18	Woburn: New Boston Street Bridge	8-47
8-19	Red Line-Blue Line Connector (Design Only)	8-51
8-20	Cambridge, Somerville, and Medford: Green Line Extension Project (Phase I: Lechmere Station to College Avenue; Phase II: College Avenue to Mystic Valley Parkway/Route 16)	8-55
8-21	Boston: Ferry Expansion: Russia Wharf/South Station	8-57
8-22	Beverly and Salem: Additional Parking Spaces	8-59
8-23	Wilmington, Trewsbury, and Andover: Lowell Junction	8-63
8-24	Fitchburg: Commuter Rail	8-65
8-25	Hopkinton, Southborough, and Westborough: Interchanges at Interstate 495/Interstate 90 and Interstate 495/Route 9	8-67

