

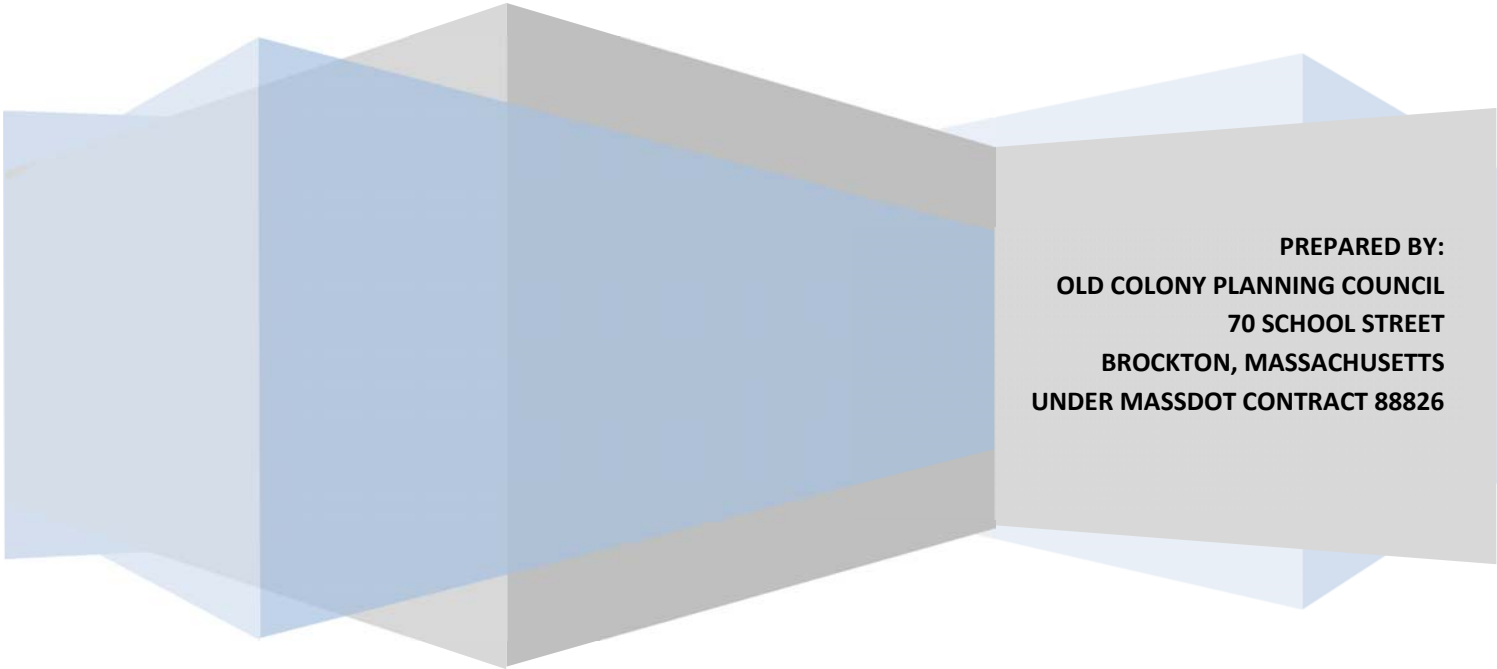
OLD COLONY METROPOLITAN PLANNING ORGANIZATION (MPO)

MovingU 2040: 2016 OLD COLONY LONG RANGE TRANSPORTATION PLAN (RTP)

- ENDORSED BY THE OLD COLONY MPO ON JULY 28, 2015
- AS AMENDED BY THE OLD COLONY MPO ON AUGUST 21, 2018

PREPARED IN COOPERATION WITH:

- BROCKTON AREA TRANSIT AUTHORITY (BAT)
- FEDERAL HIGHWAY ADMINISTRATION (FHWA)
- FEDERAL TRANSIT ADMINISTRATION (FTA)
- MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT)



PREPARED BY:
OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MASSACHUSETTS
UNDER MASSDOT CONTRACT 88826

OLD COLONY METROPOLITAN PLANNING ORGANIZATION (MPO)

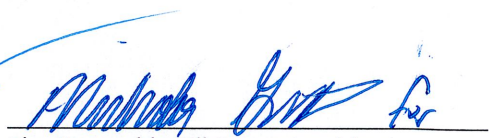
2016 OLD COLONY REGIONAL TRANSPORTATION PLAN (RTP)

ENDORSEMENT OF 2016 OLD COLONY REGIONAL TRANSPORTATION PLAN (RTP)

This is to certify that the Signatories of the Old Colony Metropolitan Planning Organization, at their Old Colony MPO meeting on July 28, 2015 hereby approve and endorse the 2016 Old Colony Regional Transportation Plan (RTP) in its entirety for the Old Colony Region, in accordance with the certified 3C Transportation Planning Process.


Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation

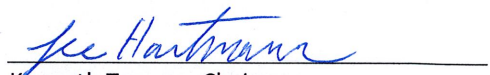
7/28/15
Date


The Honorable Bill Carpenter, Mayor
City of Brockton

7/28/15
Date


Thomas Tinlin, P.E., Acting Highway Administrator
Massachusetts Department of Transportation

7/28/15
Date


Kenneth Tavares, Chairman
Plymouth, Board of Selectmen

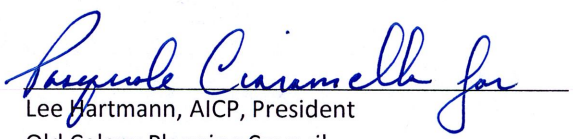
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Reinald G. Ledoux, Jr., Administrator
Brockton Area Transit

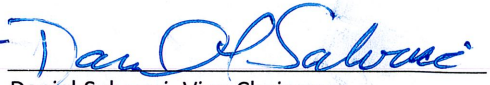
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West Bridgewater, Board of Selectmen

7/28/15
Date


Lee Hartmann, AICP, President
Old Colony Planning Council

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Daniel Salvucci, Vice-Chairman
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Pat Ciaramella
70 School Street
Brockton, MA 02301
508-583-1833 Extension 202
pciaramella@ocpcrpa.org

Title VI Specialist
MassDOT, Office of Diversity and Civil Rights
10 Park Plaza
Boston, MA 02116
857-368-8580
TTY: 857-368-0603
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Updated February 2015

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Agency Representation

MassDOT	David Mohler, AICP
MassDOT	Nikki Tishler
MassDOT District 5	Mary-Joe Perry
MassDOT District 5	Pamela Haznar, P.E.
MassDOT District 5	Timothy Kochan
BAT	Reinald Ledoux, Jr.
BAT	Kathy Riddell
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EPA	Donald Cook
FHWA	Pamela Stephenson
FHWA	Michael Chong
FHWA	Leah Sirmin
FTA	Mary Beth Mello
FTA	Noah Berger
FTA	Nicolas Garcia
Brockton Traffic Commission	Captain Robert DiBari

OCPC Transportation Staff

Charles Kilmer, AICP	Assistant Director/ Transportation Program Manager
Eric Arbeene, AICP	Community Planner
Shawn Bailey	Assistant Transportation Planner
Paul Chenard	Transportation Planner
Jed Cornock	Senior Transportation Planner
Raymond Guarino	Senior Transportation Planner
William McNulty	Senior Transportation Planner
Kyle Mowatt	Transportation Planner
Jimmy Pereira	Community/ Transportation Planner
Andrew Vidal	GIS Manager/ Communications and IT Specialist



Old Colony Planning Council (OCPC)



OCPC Officers

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OCPC Staff

Pat Ciaramella	Executive Director
Janet McGinty	Fiscal Officer
Jane Linhares	Grants Monitor/ Secretary
Patrick Hamilton	AAA Administrator
Lila Burgess	Ombudsman Program Director
Jane Selig	Ombudsman Program Assistant
Jim Watson, AICP	Comprehensive Planning Supervisor
Eric Arbeene, AICP	Community Planner
Jimmy Pereira	Community/ Transportation Planner
Bruce Hughes	Economic Development/ Community Planner
Andrew Vidal	GIS Manager/ Communications and IT Specialist
Charles Kilmer, AICP	Assistant Director/ Transportation Program Manager
Jed Cornock	Senior Transportation Planner
Ray Guarino	Senior Transportation Planner
William McNulty	Senior Transportation Planner
Paul Chenard	Transportation Planner
Kyle Mowatt	Transportation Planner
Shawn Bailey	Assistant Transportation Planner

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The views and opinions of the Old Colony Planning Council expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

This Planning Level Traffic Study was prepared by the following members of the Old Colony Planning Council staff under the direction of Pat Ciaramella, Executive Director, and the supervision of Charles Kilmer, Assistant Director / Transportation Program Manager.

Role

Staff Member

Project Manager

Bill McNulty
Senior Transportation Planner

Contributing Staff

Eric Arbeene, AICP
Community Planner

Paul Chenard
Transportation Planner

Jed Cornock
Senior Transportation Planner

Ray Guarino
Senior Transportation Planner

Charles Kilmer, AICP
Assistant Director / Transportation Program Manager

Kyle Mowatt
Transportation Planner

Jimmy Pereira
Community and Transportation Planner

Andrew Vidal
GIS Manager / Communications & IT Specialist

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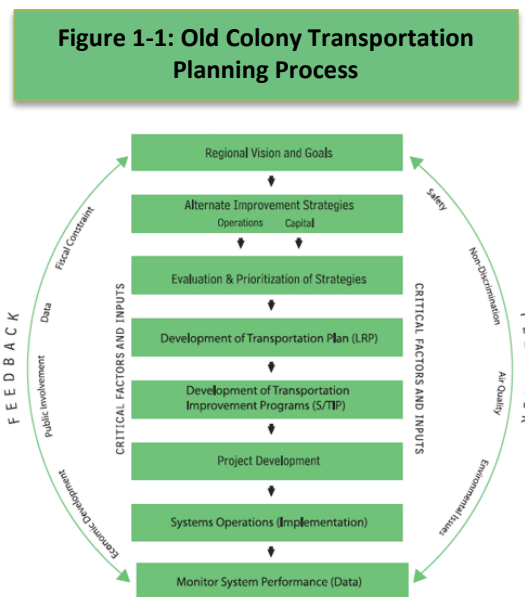
1 INTRODUCTION AND PLANNING PROCESS

The transportation planning process analyzes and presents the benefits and impacts of various transportation options such as adding new highways, implementing changes to transit service of infrastructure, creating “automobile free zones”, and improving freight movement, airports, waterways, bikeways, and pedestrian accommodations. This information is used by decision makers in the selection of preferred solutions to current and anticipated problems.

The Old Colony Metropolitan Planning Organization (MPO) is the regional transportation planning entity created under state and federal laws that require the formation of MPOs in urbanized areas with populations of more than 50,000 in order for surface transportation projects to be eligible for federal Highway Trust Fund dollars. The transportation planning area for the Old Colony MPO includes the City of Brockton and fifteen towns: Abington, Avon, Bridgewater, Duxbury, East Bridgewater, Easton, Halifax, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater, and Whitman. The planning area also includes the community service areas of the Brockton Area Transit Authority (BAT) and portions of the Massachusetts Bay Transportation Authority (MBTA), and the Greater Attleboro Taunton Regional Transit Authority (GATRA) service areas within the MPO regional boundaries.

1.1 The Cooperative, Continuous, and Comprehensive (3C) Planning Process

The Old Colony MPO is responsible for conducting a continuous, cooperative, and comprehensive transportation planning process for the Old Colony Region. It must plan for the movement of both people and goods within the Region by all modes of travel, including highways, public transportation, bicycles, and walking. It also plans for the connections (such as airports, seaports, or bus, railroad, and pipeline terminals) of these modes to the rest of the world.



The Old Colony MPO sets priorities among surface transportation improvement projects within the Region for state and federal funding. To be eligible for federal funds, the MPO endorses a

Chapter 1 – Introduction and Planning Process

Transportation Improvement Program (TIP) identifying the projects to be implemented over a four-year period.

The approval of federally aided transportation projects is contingent on there being an Old Colony MPO certified Cooperative, Continuous, and Comprehensive (or “3C”) transportation planning process Transportation Planning Process in place.

The State and the Old Colony MPO certify to the FHWA and the FTA that the “3C” Transportation Planning Process addresses the major issues facing the area and it is being developed in accordance with FTA/FHWA regulations governing the implementation of the Moving Ahead for Progress in the 21st Century Act (MAP-21). The 3-C Process is also developed with regard to EPA regulations governing the implementation of the Clean Air Act of 1990 (CAAA); and it fully incorporates the applicable requirements of the 1964 Civil Rights Act and the Americans with Disabilities Act of 1990 (ADA).

Every four years, FTA and the FHWA make a “Certification Determination” for the transportation planning process in each urbanized area. In general, Certification means that the planning process “is being conducted in a cooperative, continuous, and comprehensive manner, and has resulted in plans and programs consistent with the comprehensively planned development of the area.”

The Old Colony MPO is responsible for implementing the urban transportation planning process and for developing and endorsing the Unified Planning Work Program (UPWP), Regional Transportation Plan (RTP), Transportation Improvement Program (TIP), and Public Participation Plan (PPP) for the region. Membership of the Old Colony MPO is as follows:

- The Secretary and CEO of the Massachusetts Department of Transportation
- The Highway Administrator of the Massachusetts Department of Transportation
- The President of the Old Colony Planning Council
- The Administrator of the Brockton Area Transit Authority
- The Mayor of the City of Brockton
- The Chief Elected Official of Plymouth
- The Chief Elected Official from two (2) communities, other than Brockton or Plymouth, duly elected by the Old Colony Planning Council, to represent locally elected communities. No more, or less, than one representative from towns with populations of 12,000 or below (Avon, Halifax, Hanson, Kingston, Plympton, and West Bridgewater), and, no more, or less, than one representative from towns with populations over 12,000 (Abington, Bridgewater, Duxbury, East Bridgewater, Easton, Pembroke, Stoughton, and Whitman)

At a full Council meeting, the Old Colony Planning Council elects the above-cited locally elected community officials to the Old Colony MPO. The electoral process is the sole responsibility of the OCPC with full consideration to nominations recommended by the Old Colony Joint Transportation Committee (JTC). This process was approved by the Old Colony MPO in 2003

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and is periodically reviewed. The term of office is for two years. The OCPC and the JTC make every effort to provide for region-wide geographic balance of the communities represented on the Old Colony MPO.

The JTC Chairperson, and one representative each from both the FHWA and the FTA are considered ex-officio, non-voting members of the Old Colony MPO. Designees or alternates are typically limited to the persons who are directly responsible and accountable to the official Old Colony MPO member that they are representing.

The members of the Old Colony MPO recognize that transportation planning and programming must be conducted as an integral part of, and consistent with, the comprehensive planning and development process, and that the process must involve the fullest possible participation by state agencies, local governments, private institutions, and other appropriate groups.

1.2 Functional Responsibilities of Participating Agencies and Groups

The following is a list of participating agencies and groups in the transportation planning process, and a description of the responsibilities of each.

Local Representatives: The local representatives (Brockton, Plymouth, and the locally elected communities) to the Old Colony MPO are responsible for articulating a local government perspective of regional transportation problems and issues, and the needs for the community or agency on which they represent, and the Region as a whole.

Massachusetts Department of Transportation (MassDOT): The Massachusetts Department of Transportation has the statutory responsibility to conduct comprehensive planning and to coordinate the activities and programs of the state transportation agencies.

MassDOT assists in organizing and conducting Old Colony MPO meetings, keeping records, and reporting major statewide and inter-regional policies and issues as they develop. MassDOT is responsible for making appropriate planning funds available to the OCPC by contract to assist in the implementation of the required planning work program as defined in the approved Unified Planning Work Program (UPWP). MassDOT also provides the necessary data, technical support, and staff support required to assist in fulfilling the transportation planning needs of the Old Colony Region and Commonwealth of Massachusetts. MassDOT is responsible for making appropriate FTA transit planning funds available to the OCPC by contract to assist in the implementation of the required planning work program as defined in the approved UPWP.

Massachusetts Department of Transportation (MassDOT) Highway Division: The Massachusetts Department of Transportation Highway Division, has the statutory responsibility for the construction, maintenance, and operation of state roads and bridges, and serves as the principal source of transportation planning in the Commonwealth. MassDOT is responsible for the continual preparation of comprehensive and coordinated transportation plans and programs.

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Old Colony Planning Council (OCPC): Established by Chapter 332 of the Acts of 1967, OCPC is the regional planning agency for the metropolitan Brockton area. The Council's planning jurisdiction includes the City of Brockton and the towns of Abington, Avon, Bridgewater, East Bridgewater, Easton, Hanson, Halifax, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater and Whitman. The policy board is composed of one delegate and one alternate appointed by a vote of the Board of Selectmen and Planning Board of each member community. In the case of the City of Brockton, the Mayor appoints the delegate and alternate. The Council is authorized to prepare and revise comprehensive plans. OCPC is recognized by the MPO as the officially designated regional planning agency for the Old Colony MPO Region, having the statutory responsibility for comprehensive planning, including transportation planning. Currently, the Council's areas of major emphasis are economic development, transportation, safety and security, water quality, land use and housing, and elder service planning and ombudsman programs.

The OCPC is responsible for comprehensive regional planning and is the transportation planning agency for the Old Colony MPO and Old Colony Region. The OCPC maintains qualified transportation planning staff, and is principally responsible for the maintenance of the transportation planning process and for the support and operation of the Old Colony Joint Transportation Committee and MPO.

Brockton Area Transit Authority (BAT): The Brockton Area Transit Authority has the statutory responsibility to provide mass transportation in the area constituting the authority, and to provide mass transportation service under contract in areas outside the authority.

BAT, in addition to its statutory responsibility of providing mass transportation, assists in obtaining and ensuring input and participation in multimodal transportation planning from local elected officials and the public. BAT actively and consistently participates in the 3C transportation planning and programming process and represents the region's concern for public transportation deficiencies and solutions to transportation demands and needs.

1.3 Functions of the Old Colony MPO

The Old Colony MPO reviews and annually endorses the Unified Planning Work Program (UPWP), the Transportation Improvement Program (TIP), and, the Public Participation Plan (PPP). Additionally, the Old Colony MPO reviews and endorses, at least every four years, a Regional Transportation Plan, with a 20-year horizon; as well as such transportation plans and other products that federal and state laws and regulations may from time to time require.

The Old Colony MPO is the forum for cooperative decision-making involving allocation of federal transportation funding by chief elected officials of general-purpose local governments, regional authorities and agencies, and state agencies in the Old Colony Region.

In the resolution of basic regional transportation policy, the Old Colony MPO seeks and considers the advice of all interested parties and the Joint Transportation Committee (JTC). The Old Colony Planning Council Transportation Staff provides the JTC with information and analysis

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in the form of reports, briefings, and discussions concerning their plans, programs, and priorities so that they can carry out their functions in a timely fashion.

The Old Colony MPO appoints the committees it determines necessary to accomplish its business. Committees may consist of Old Colony MPO members, their designees, the JTC, and transportation providers as appropriate. The Old Colony MPO assigns duties to the committees, as warranted.

1.4 Operation of the Old Colony MPO

The Old Colony MPO meets in the Region at least twice per year and usually more often as may be requested by any one of the Signatories.

In the absence of the Chairman, the Vice-Chairman chairs the meeting. A Vice-Chairman of the Old Colony MPO is elected for a term of two years and is elected from among the non-state permanent members of the Old Colony MPO (City of Brockton, Town of Plymouth, Brockton Area Transit Authority, Old Colony Planning Council, and the two locally elected communities). The Old Colony MPO elects other officers as deemed necessary.

Votes of the Old Colony MPO, including those on all regional certification documents (i.e. the Transportation Improvement Program (TIP), the Regional Transportation Plan (RTP), the Unified Planning Work Program (UPWP), Air Quality Conformity Determinations, compliance with the Americans with Disabilities Act (ADA), shall be by simple majority vote, provided that a quorum is present, and that the affected implementation agency (MassDOT – Highway Division for highway and bridge projects, BAT for regional transit projects, and MassDOT for commuter rail projects) is included in the affirmative vote.

1.5 Transportation Advisory Group

In order to accomplish the objectives of the 3C process, the Old Colony MPO established a committee known as the Joint Transportation Committee (JTC) to serve as the Transportation Policy Advisory Group for the Old Colony Region, in accordance with earlier agreements. The Old Colony MPO periodically reviews the membership on the Joint Transportation Committee, in a manner that provides for a widely representative viewpoint, and ensures a balanced consideration of transportation issues. Consistent with the provisions of the Memorandum of Understanding, the Joint Transportation Committee adopts by-laws and other procedures as may be necessary to govern its operation. The functions of the JTC are:

- To advise the Old Colony MPO and OCPC on matters of policy affecting the conduct of the 3C transportation planning and programming process for the Region.
- To advise the Old Colony MPO and OCPC on such regional transportation documents as may from time to time be required by state or federal laws and regulations (RTP, TIP, UPWP, and PPP their related adjustments and amendments).
- To provide maximum public participation in the transportation planning and programming process by providing a forum to bring the Old Colony MPO together with other public agencies, elected and appointed officials of cities and towns, and

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individuals concerned with the transportation planning and programming process; thereby facilitating, wherever possible, the consistency of transportation plans and programs for the Old Colony Region with the policies, priorities, and plans of affected state and regional agencies, local communities, private groups, and individuals within the Old Colony Region.

The JTC includes a representative from each OCPC community, whom are appointed by the Board of Selectmen/Mayor in the community. Membership is open to any interested resident, representative from a transportation provider, or interested group. The JTC meets on the second Thursday of each month at the OCPC office.

The Old Colony MPO provides complete information, timely public notice, and full public access to decisions and documents. It supports early and continuing public involvement in the development and review of its plans and programs. It especially tries to seek out and consider the interests of people whose needs may be not be well served by the existing transportation system, such as low income and minority households and persons with limited personal mobility. To assist with this, OCPC maintains a Transportation Advisory Network (TAN). The TAN is a mailing list of individuals and organizations that have an interest in local transportation issues. The TAN provides a broad community resource for the formation and review of transportation plans, policies and strategies. This network provides key contact persons for outreach efforts, dissemination of information, and informal review and comment to ensure incorporation of varied community needs, concerns, and interests.

1.6 The Transportation Planning Process

The transportation planning process has four basic elements; a Unified Planning Work Program, a Regional Transportation Plan, Transportation Improvement Program, and Public Participation Plan. These elements are reviewed by the JTC, OCPC, and are endorsed by the Old Colony MPO.

Public Participation Plan (PPP): The Public Participation Plan (PPP) identifies strategies employed by the MPO to provide complete information, timely public notice, and full access to key decisions to the public prior to the adoption or amendment of the plans and programs for which the MPO is responsible. This document supports the early and continuing involvement of the public in the MPO process, as required by federal law.

Unified Planning Work Program (UPWP): The Unified Planning Work Program (UPWP) describes and provides budgetary information for the transportation planning tasks and activities, which are to be conducted in the region during the coming year. The UPWP is a federally required certification document, which must be prepared and endorsed annually by the Old Colony MPO prior to the start of the planning program. The OCPC has the responsibility of preparing the UPWP. The planning activities are organized first by work element in a format that will allow efficient administration, management, and reporting.

The UPWP describes all the work to be accomplished by the Old Colony MPO. Each transportation planning activity is described as a procedure under specific work tasks. For each

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procedure, the anticipated accomplishment or product and the estimated work force resources needed are also given. For each work task, the total staffing requirements, task budget, and sources of funding are given. For convenience in management, similar work tasks are grouped into broad areas or elements as follows:

- Management and Support of the Planning Process and Certification Activities
- Data Collection and Analysis Activities
- Short Range and Long Range Transportation Planning Activities
- Other Transportation Technical Activities

The UPWP continues to expand on several major tasks that are specifically targeted to implement provisions of several pieces of federal legislations, such as the Moving Ahead for Progress in the 21st Century Act (MAP-21), the Clean Air Act Amendments of 1990, and the Americans with Disabilities Act.

1.6.1 The Regional Transportation Plan

Regional Transportation Plan (RTP): The RTP provides a document and a process that will meet the challenges of preserving and expanding the transportation system. Following the directives of the law, it includes goals, policies, analyses, and recommendations necessary to build and maintain an efficient, effective and affordable regional transportation system. The intention of the RTP is to build on the current system, working to make it comprehensive and fully integrated.

The RTP addresses a twenty-year planning horizon and includes both short and long range strategies/actions that lead to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods. Additionally, the Plan examines current and forecasted transportation and land use conditions and trends, and provides an overall framework for the future transportation system. Furthermore, the RTP draws upon the Statewide Transportation Plan and the MassDOT Project Development and Design Guide Book. The mission of the RTP is to provide a safe and efficient transportation system that promotes multi-modalism (roads, transit, sidewalks, bicycles, etc.), supports projected growth, and addresses livability and social concepts, economic sustainability, and environmental impacts through effective planning/policy and local/regional coordination.

The short and long range strategies/actions constitute the RTP. The long range element addresses the long-range transportation needs of the region and identifies needed major changes in the transportation system and transportation policy. It establishes inter-regional and intra-regional transportation goals and objectives.

The short range element addresses the transportation strategies/projects that will be implemented within five-years. The purpose of the short range element is to coordinate the different parts of a transportation system, such as pedestrian and bicycle facilities, transit, rail, freight, and highway, to achieve maximum efficiency and productivity of the transportation system as a whole. Simply stated, the goal of the short range element is to insure, through the

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promotion of management systems and low capital projects, that the region's existing transportation system is utilized and maintained fully before new facilities are added. The short range element (five years) essentially comprises the TIP.

The transportation management systems provide a process that furnishes information on transportation system performance to decision makers for selecting and implementing cost effective strategies/actions to manage new and existing facilities so that congestion is alleviated and the mobility of persons and goods is enhanced.

Transportation Improvement Program (TIP): The Transportation Improvement Program (TIP) is a listing of transportation projects proposed for implementation during the next four federal fiscal years. Projects listed in the TIP include those in the short range element of the RTP. In the TIP, projects are classified under federal and non-federal funding categories and assigned a local priority. The TIP briefly describes the project as well as its projected costs and funding sources.

As part of the TIP development, current and proposed projects are evaluated using Transportation Evaluation Criteria, and recommended to the Old Colony MPO for consideration and approval. The collective staffs evaluate candidate projects for the Old Colony MPO using the Transportation Evaluation Criteria of Condition, Mobility, Safety and Security, Community Effects and Support, Land Use and Economic Development, and Environmental Effects. After the evaluations, the results are provided to the Old Colony MPO for review and approval. Once the Old Colony MPO has reviewed and approved the evaluations, the OCPC staff then uses the evaluation results, as well as readiness information, available funding, and other pertinent information to develop a Draft TIP. As part of the development process, the Draft TIP is reviewed by the JTC, the OCPC, and the MPO, and released for a 30-Day Public Review Period. After the 30-Day Public Review Period, the Final Draft TIP is sent to the Old Colony MPO for consideration and approval.

1.7 Public Participation and Outreach Consultation Process

During the 2016 Regional Transportation Plan update, public participation was designed to ensure opportunities for the public to express its views on transportation issues and to become active participants in the regional planning and transportation decision-making process.

The outreach process consisted of activities designed to build better relationships with individuals that are engaged with their communities and businesses, along with individuals of "traditionally underserved" communities and Limited English Proficiency, local officials, non-profit organizations, and transportation agencies.

One of the main purposes of the public participation process is to educate and inform stakeholders on new initiatives such as livability, sustainability, and climate change. The process was designed to fulfill federal-aid requirements and to document people's transportation and land use needs in their communities.

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Comments received during the public participation and outreach processes helped shape the Goals, Objectives, and Performance Targets and Measures along with recommendations included in this Plan. Some of the common themes of comments received during this process include:

- Reduced congestion
- More transportation mode choices: improved transit; need for improved infrastructure to accommodate bicycle and pedestrian travel
- More “Smart Growth” in future development
- Improved safety for bicyclists, pedestrians, and older persons
- A more reliable transit system
- Extended transit hours, and better connections between different transit systems

These themes are carried throughout the Goals, Objectives, and Performance Targets and Measures and in turn those recommendations that have been developed to guide the Metropolitan Planning Organization in achieving those Goals.

1.7.1 Language Accessibility

Demographic data from the United States Census indicate that English, Spanish, French Haitian (Creole), and Portuguese are the predominant languages spoken by significant populations in the Old Colony region. Materials used during the public outreach and consultation process were made available in these languages. Additionally, multilingual staff members were on-hand at public meetings and forums. Finally, translation services were made available to any person requiring such assistance.

1.7.2 Interagency Consultation and Stakeholders Engagement

Information of the multiple RTP events was distributed to the public through reports and editorial board briefings, press releases, and media packages. Mailings were sent in a regular basis to a list of self-identified interest groups. Fact sheets and information of new transportation initiatives were posted on the OCPC website and were distributed during the events. Printed ads were published and electronic notices were distributed to all the communities and related agencies. The list below illustrates the stakeholders that participated in the consultation process.

- Federal Highway Administration and Federal Transit Administration
- Massachusetts Department of Transportation
- Private and Public Local Transportation Agencies (BAT, GATRA, SSCAC and MBTA)
- Public Elected Offices
- Chambers of Commerce (Metro South, Plymouth and South Shore)
- Housing Authorities
- Cape Verdean Association
- South Shore Haitians United For Progress
- Area Agencies on Aging and Councils of Aging
- State Department of Environmental Protection, Federal Environmental Protection Agency, Department of Public Health



Figure 1-2: OCPC staff met with State and local agencies to discuss new transportation initiatives during Strategic Highway Safety Planning Meeting in Brockton

1.7.3 Public Participation Activities

In order to improve public consideration of issues and to maximize citizen involvement, the Old Colony Planning Council planned a number of diverse activities to keep the public engaged and informed regarding on-going transportation and comprehensive planning efforts in the region. OCPC organized a comprehensive survey, five visioning workshops, eight open houses, and three table events.

1.7.4 Survey

The survey was designed to educate the public on new initiatives and to obtain people’s comments on mobility, safety and security, land use policies, and environmental protection issues. The survey was available electronically through Survey Monkey on the OCPC website, social media, and electronic newsletters. In addition, hard copies of the survey were also available in the Council’s office and were distributed throughout the region during the outreach campaign. In order to reach out to all ethnic groups in the region, the survey was also available in multiple languages: English, Spanish, French Haitian (creole) and Portuguese. Results of the survey assisted with the development of performance measures, and the establishment of short and long term planning and capital needs identification. In addition, the survey results validated existing congested corridors identified in the Congestion Management Process and need for improved bicycle, pedestrian, ADA accommodations.

1.7.5 Public Visioning Workshops

Regional visioning workshops were conducted during the 2016 Regional Transportation Plan Update. They were designed to inform the public and local stakeholders on new transportation and land use initiatives. The following four topics were discussed at the workshops:

- Protecting and Enhancing Regional Mobility
- Building Sustainable Livable Communities
- Enhancing Safety and Security
- Environmental Protection and Climate Change

1.7.6 Plymouth Visioning Workshop

The following list of comments is a summary of the participants' vision of the Old Colony region for the next twenty years:



Figure 1-3: Plymouth Visioning Workshop

Mobility

- Multi Modal Choices – People live and work in vibrant communities where they can choose whether to walk, bike, commute by transit, or ride share.
- Currently, road designs are auto-centric; having a complete streets approach can benefit all road users. When new roads are being planned, planners and engineers would include pedestrians, cyclists, and transit users.
- Pedestrian accommodations (e.g. plowed sidewalks, clear bus shelters) should be considered throughout the winter season.
- When people have safe and reliable transportation choices, the benefits are widespread ensuring equity. Placing count-down clocks with multiple language capabilities on shelters and acquiring eco-friendly transit vehicles creates a safer system.
- A bicycle network is nonexistent in Old Colony Region. Having bicycle lanes and bicycle boxes help increase delineation and awareness whether a bicyclist is in a bike lane or sharing the road.
- A great bicycle network also has great bicycle accommodations such as bicycle cages and bike racks, bicycle loops at intersections, repair stations, and a mixture of infrastructure that caters to different riders at different comfort levels.

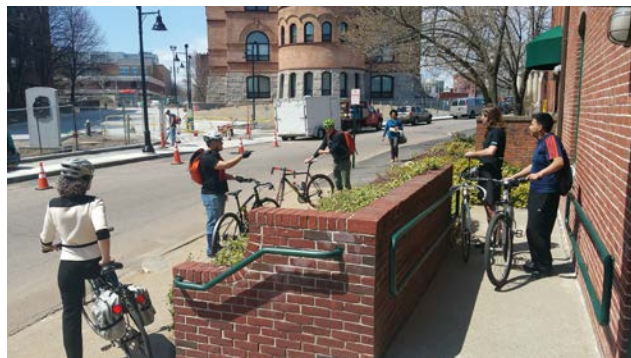


Figure 1-4: Staff leading tour with MassBike and guests

Livability

- Encouraging Smart Growth in communities would ensure that density and mixed use planning are utilized, Transit Oriented Development included.
- There should be an increase of funding for improving the bicycle and pedestrian network. Enabling people to utilize a continuous sidewalk and bicycle network throughout the region. A well invested network should include:
 - Street trees, adequate timing for pedestrian count down signals, traffic calming devices, complete street ordinance, and enforcement.
- Clear communication should be set between community members and service providers, but also between municipalities and other agencies. Whenever a utility company is engaged in road construction, municipalities should coordinate with the companies in order to plan ahead and begin road work. Service providers must have a clear line to the community in any emergency situation, whether through social media, automated telephone messages, or signs and notices.

Safety and Security

- Visibility is an issue in the Old Colony Region. Lighting and retroreflective signing may decrease the chances of fatal accidents and allow motorists to see pedestrians and bicyclists at night.
- Safety beacons should be incorporated into walking patterns or walkways throughout the region.
- There needs to be a strong distinction between vehicle and pedestrian space.
- Education is much needed in regards to bicycle and pedestrian safety. MassDOT has created the *LOOK: Sharing the Road Guide for Bicyclists, Pedestrians, and Motorists*

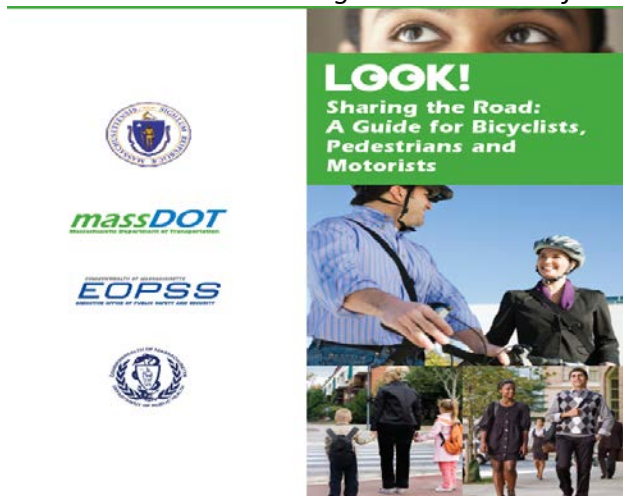


Figure 1-5: *MassDOT's Look Brochure*

Environment

- Incentivizing Complete streets will help curb Green House Gas Emissions
- Having an increase in charging stations in the region will allow energy efficient cars to travel farther throughout the region
- Transportation projects should have a scoring system that takes density into account

1.7.7 Open House Events

The open house events were designed for people to come in and interact with the OCPC staff and at the same time to learn about new initiatives in the region. With this method, the public feels more comfortable sharing information and opinions that will support the development of the Regional Transportation Plan. The open house events were offered during different times and locations to capture different audiences.

The following list of comments summarizes some of the input received during the open houses:

- Extend bus services to communities that lack public transportation.
- More “Ride Share” opportunities are needed in the region.
- The commuter rail needs more trains, more frequently. More people would take the trains if the times were better.
- Connect BAT and GATRA bus systems to create more job opportunities
- Improve lighting, roadway markings and signage for pedestrian safety and also for elderly drivers.

1.7.8 Table Events

The table events were designed to display preliminary RTP findings and products during different activities. These activities included attending events hosted by local community organizations, visiting the Old Colony YMCA in Brockton and Stoughton, Massasoit College and local Farmer’s Market. Similar to the open house events, table events were designed with the purpose of engaging the public in an informally manner to learn more about new projects and initiatives in the region. The following list shows the table events organized during the plan update.

<u>Date</u>	<u>Event</u>	<u>Organization</u>
February 11, 2015	Music of Nina Simone	Massasoit Community College
March 24, 2015	Consular Assistance	Cape Verdean Association
May 2, 2015	Family Center Open House	CC Brockton



Figure1-6: Massasoit College Table Event

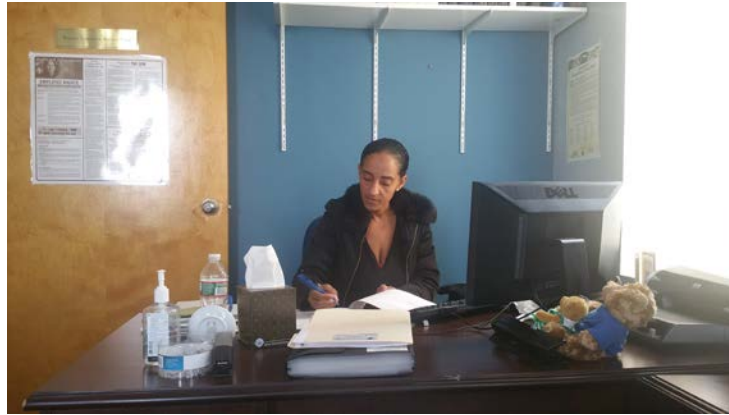


Figure 1-7: Maria of Cape Verdean Association taking the Moving U 2040 Survey



Figure 1-8: South Shore Haitians United For Progress CC Brockton Table Event

1.8 Environmental Justice

Environmental Justice is an important part of the planning process and is considered in all phases of planning. A truly integrated and effective planning process actively considers and promotes environmental justice within projects and groups of projects, across the total plan, and in policy decisions. All reasonably foreseeable adverse social, economic, and environmental effects on minority populations and low-income populations must be identified and addressed. There are three fundamental Environmental Justice principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

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- To prevent the denial of, reduction in, or significant delay in the receipt of project benefits by minority populations and low-income populations.

Public involvement is an integral part of transportation planning and project development decision-making. The DOT Order (5610.2) on Environmental Justice directs the provision for minority populations and low-income populations greater access to information on and opportunities for public participation in matters that may affect human health and the environment.

Effective public involvement in the planning and project-development process can alert State and local agencies to environmental justice concerns during project-development. Continuous interaction between community members and transportation professionals is critical to successfully identifying and resolving potential Environmental Justice concerns.

The staff developed public-involvement procedures that provide for consideration of Environmental Justice. These procedures provide an inclusive, representative, and equal opportunity for two-way communication resulting in appropriate action. Environmental Justice is considered in all aspects of planning and project decision-making, including the design of both the public-involvement plan and proposed facilities.

1.8.1 Inclusive Public Participation

These are specific examples on how the Old Colony Planning Council reaches out to minority communities on an ongoing basis:

- Community Connections: Monthly newsletter (newsletter goes to 700 businesses and includes laundry mats, grocery stores, supermarkets, etc.), free quarterly magazine (magazines go to 5,000 locations and includes hospitals, medical centers, schools and universities, employment centers, drug stores, etc.), mass email to minority leaders and interested parties (approx. 1,000 email addresses)
- Yearly meetings with: Adult Education Center, BAT Intermodal Centre, Councils on Aging, Brockton Mass in Motion, South Shore Haitians United For Progress, Cape Verdean Association, and Greater Brockton Health Alliance. This list continues to grow along with our ongoing outreach.

1.8.2 Meeting with Minority Groups

- **South Shore Haitians United For Progress/ Cape Verdean Association.** Input received at these meetings are summarized as follow:
 - There is no bus connection on Montello St. Children have to cross two unsafe intersections to get to the Cape Verdean Association Office.
 - There are language and physical barriers for the elderly population, especially in rural areas of the Old Colony Region
 - There is a need for exclusive bicycle/multi-use pedestrian paths
 - There is a need for more affordable housing in Brockton near Transit Oriented locations

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- There is no east-west transit connection. If people want to go to Plymouth, they have to go to Boston and then transfer to a train to Kingston or Plymouth (not too frequent)

1.8.3 Stakeholder Participation in Forms other than Writing

- Focus meeting/interviews with underrepresented groups such as Cape Verdean Association, South Shore Haitians United For Progress, Chamber of Commerce, and Area Agency on Aging
- Table events, open house meetings, and visioning workshops

1.8.4 Benefits and Burdens

Environmental Justice Analysis asks whether a proposed action or plan causes disproportionate adverse effects on minority and low-income populations, and whether these populations are denied benefits. A framework of analysis that can determine how a proposed action or plan could differentially affect diverse populations is important. This uses an analysis of benefits and burdens. In addition, computer mapping of Environmental Justice Areas with past, present, and future TIP projects, is used to identify the distribution of funding (to ensure geographic equity) and to determine priorities areas of need/ and or concern. The mapping includes available transit (with ¼ mile and ½ mile buffer), commuter parking facilities, pavement conditions, high crash locations, and areas of congestion.

Examples of the Benefits considered during the development of the TIP and the RTP are:

- Mobility
- Livability and Sustainability
- Accessibility
- Condition of Infrastructure
- Environmental Protection
- Reliability
- Safety
- Security
- Climate Change Adaptation
- Efficiency

Examples of the burdens potentially considered during the development of the TIP and the RTP are:

- Air, noise, and water pollution and soil contamination.
- Destruction or disruption of community cohesion or a community's economic vitality.
- Destruction or disruption of the availability of public and private facilities and services.
- Adverse employment effects.
- Displacement of persons, businesses, farms, or nonprofit organizations.
- Increased traffic congestion, isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community.
- The denial of, reduction in or significant delay in the receipt of, benefits of programs, policies, or activities.

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The examination of benefits and burdens will help to determine that no RTP projects will result in adverse impacts to the Environmental Justice Areas in the Old Colony region.

An assessment of the benefits and burdens of the Transportation Improvement Program (TIP) was completed to identify all regionally significant projects constructed and/ or programmed in the Old Colony Transportation Improvement Program during the period of 2004 – 2014. Constructed projects funded through the TIP were included to provide a benchmark of investments. Transportation Improvement Program and analyzed the location of these improvements relative to locations of minority and low-income populations. For the purposes of identifying these populations, the staff utilized the MassGIS Environmental Justice GIS Shape file. Polygons in the Environmental Justice (EJ) Populations layer represent neighborhoods across the state with high minority, non-English speaking, low-income, and foreign-born populations. Data in this layer were derived from Summary File 3 at the block group level (Summary Level 150) from 2000 U.S. Census data).

Regionally, it was determined that about 46.7% of the identified improvement projects, representing approximately 47.6 percent of the identified investment dollars on the FFY 2011-2014 TIP are located in or immediately adjacent to EJ communities. This exceeds the 25.9 percent of the region’s population identified as living in EJ communities as documented in Table 3. Non-mappable projects, such as transit vehicle replacements or rehabilitations, bridge and roadway repair line items for future projects to be defined, and other non-location-specific projects are not included in this analysis. Moreover, many of the projects that are not located directly within an EJ community are projects of key regional significance, such as interstate highway improvements. These improvements benefit the region as a whole, and provide access to many key employment centers, including downtown Brockton and regional shopping centers.

OCPC undertook further analysis to determine the level of investments during the period of 2004-2010 through previous Transportation Improvement Programs. From that analysis, it was concluded that about 43.3 percent of the identified improvement projects, representing approximately 46.5 percent of the identified investment dollars allocated during the TIP years of 2004-2010 are located in or immediately adjacent to EJ communities. This exceeds the 25.9 percent of the region’s population identified as living in EJ communities (Table 4).

As such, from the review, it may be concluded that the public investment and involvement in the regional transportation planning process and the resultant FFY 2011-2014 Transportation Improvement Program and previous TIPs (dating back to 2004 demonstrate that the benefits of the regional transportation planning process accrue to both EJ and Non-EJ communities. Low-income and minority populations are not disproportionately impacted and are beneficiaries of the transportation planning process in the Old Colony Region.

As a result, the Old Colony Metropolitan Planning Organization along with Old Colony Planning Council staff continues to work with our regional partners in the advancement of

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environmental justice principles throughout the regional planning process. Such analyses will be conducted annually and included in the endorsed TIP.

2 OLD COLONY MISSION, GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

The mission, goals, objectives, and performance measures were developed through a comprehensive, continuing, and cooperative effort between the Old Colony Planning Council, the Old Colony Metropolitan Planning Organization (MPO), the Joint Transportation Committee (JTC), and the stakeholders in the transportation system. The mission and the related goals, objectives, and performance measures reflect directly and expand upon the planning factors prescribed in federal MAP-21 legislation. In addition, these regional goals and policies are consistent with the vision of the Commonwealth of Massachusetts and of the communities of the Old Colony Region.

2.1 Mission Statement

The Regional Transportation Plan (RTP) addresses a twenty year planning horizon and includes both short and long range strategies and actions to the development of an integrated intermodal transportation system for the efficient movement of people and goods. Additionally, the Regional Transportation Plan examines both current and forecasted transportation and land use conditions, and provides framework for the future transportation system. The mission statement for the 2016 MovingU 2040 Regional Transportation Plan is defined as a creation of:

How we get there

Ensure Equity - *Distribute burdens and benefits fairly and provide equitable access to transportation choices*

Ensure Fiscal Stewardship - *Prioritize investments that achieve multiple goals, giving taxpayers and passengers more for their money*

Deliver Accountability - *Promote public and private collaboration with meaningful community participation, and with transportation agencies that take responsibility*

Essential elements to achieve the mission include ensuring equity by distributing burdens and benefits fairly, providing equitable access to transportation choices, ensuring fiscal stewardship by prioritizing investments that achieve multiple goals, promoting public and private collaboration with meaningful community participation and having transportation agencies that take responsibility for their actions.

Chapter 2 – Mission, Goals, Objectives, and Performance Measures

Given this framework, the mission of the Old Colony Regional Transportation Plan is to provide a safe and efficient transportation system that promotes multi-modalism (roads, transit, sidewalks, bicycles, etc.), supports projected growth, addresses social and economic sustainability, community livability, mitigated environmental impacts and clearly understanding land use implications through effective planning/policy and local/regional coordination.





2.2 Goals, Objectives, and Performance Measures

These goals and objectives were developed to guide the region’s transportation planning activities through the near future, as were the performance measures that work towards achieving these goals and objectives. Planning staff collaborated with stakeholders in an attempt to develop realistic and achievable targets and performance measures for each individual objective. However, consensus could not be reached on performance measures for certain Objectives due to the difficulty in quantifying measurable results. While a specific target was unable to be determined for every Objective, it was the determination of all during the consultation process that those Objectives for which targets were not developed maintained importance in the transportation planning process and should remain in the Plan. The Old Colony MPO will continue to collaborate with its planning partners and refine the development of targets and performance measures for Objectives as they are applicable. Additionally, planning staff will continue to self-evaluate on progress towards all objectives and report to its planning partners and to the public as appropriate.



2.2.1 Goal 1: Safety and Security

Goal 1: Safety and Security: To ensure that the transportation system and its users are safe and secure.

Objectives:

- Reduce the number and rates of fatalities and serious injuries
 -  **Target and Performance Measure:** Reduce motor vehicle, pedestrian, and bicyclist fatalities, hospitalizations, and crashes by 10 percent in 10 years
 -  **Target and Performance Measure:** Conduct Road Safety Audits for a minimum of 3 high crash locations (MassDOT Top 5% Crash Clusters) per year, including minimum of 1 pedestrian/walkability audit and one bicycle audit per year
 -  **Target and Performance Measure:** Fully program minimum HSIP targets each TIP year and seek to program Statewide HSIP funds when available/feasible for priority safety related projects
- Provide and maintain safe fixed route service (e.g. Preventable Accidents per 100K miles)
 -  **Target and Performance Measure:** Maintain fixed route service preventable accidents/ 100k miles below 2 (FY 2014 actual is 1.02) (from BAT Performance Dashboard)





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- Provide and maintain safe demand response service (Preventable accidents/ 100k miles)
 -  **Target and Performance Measure:** Maintain demand response service preventable accidents/ 100k miles below 2 (FY 2014 actual is 1.20) (from BAT Performance Dashboard)
- Protect the viability of transportation infrastructure to accommodate emergency response and evacuations
- Protect transportation system users from safety and security threats
- Increase number of Safe Routes to School Partner Schools
 -  **Target and Performance Measure:** Increase percentage of SRTS Partner Schools to 85% in 10 years. Currently, 70% of eligible partner schools are partner schools

2.2.2 Goal 2: System Preservation

Goal 2: System Preservation: To maintain the transportation system in a state of good repair (SGR).

Objectives:

- Provide and maintain fixed route and demand response state of good repair
 -  **Target and Performance Measure:** Increase miles between breakdowns with passenger interruption on fixed route to 20,000 (standard) within 10 years (currently 18,020) (from BAT Performance Dashboard)
 -  **Target and Performance Measure:** Increase miles between breakdowns with passenger interruption on demand response to 10,000 (standard) within 10 years (currently 6,452) (from BAT Performance Dashboard)
- Improve bridge conditions
 -  **Target and Performance Measure:** Maintain percentage of bridges categorized “structurally deficient” below 5% and increase overall average AASHTO rating (current 79) by 10 percent by 2040
- Improve pavement conditions and state of good repair
 -  **Target and Performance Measure:** Achieve 50% of federal-aid eligible roadways in the region with a PCI-based pavement ranking of “Good” of “Excellent” within 10 years








2.2.3 Goal 3: Regional Mobility

Goal 3: Regional Mobility and Congestion Management: To reduce congestion, improve mobility, and improve access to critical essential services.

Objectives

- Promote Mode Shift by increasing use of transit, carpool/vanpool, and non-motorized transportation modes such as bicycling and walking

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-  **Target and Performance Measure:** Achieve 15% of commuters in the Old Colony region using healthy transportation modes (transit, walking, bicycling, etc.) within 10 years (10.5% of surveyed commuters in Old Colony Region were using transit, walking, or bicycling in the 2010 Massachusetts Travel Survey)
- Reduce traffic congestion, and improve level of service and access management
 -  **Target and Performance Measure:** Monitor congestion levels on federal-aid eligible highway network annually, and highlight corridors with volume to capacity (v/c) ratios of 0.8 or greater for targeted study and/or improvements
- Maintain and improve transit system efficiency and capacity
 -  **Target and Performance Measure:** Achieve average on-time ranking on fixed-route system of 98% by 2040 (from BAT Performance Dashboard)
- Increase automobile and bicycle parking capacity and usage at transit stations and commuter lots
 -  **Target and Performance Measure:** 100% of intermodal facilities with adequate bicycle parking by 2040
- Eliminate bottlenecks on limited access highways and on the freight network
- Improve and expand human service coordination, mobility, and accessibility for all modes
- Reduce number and size of gaps in the ADA-accessible sidewalk network
- Increase use of traffic signal priority (hold current green light) for transit vehicles and traffic signal pre-emption for emergency vehicles (override programmed phasing to provide approaching emergency vehicles a green light)
- Monitor utilization and congestion levels at commuter rail and Park & Ride parking facilities
 -  **Target and Performance Measure:** Record utilization data twice annually and report data to MassDOT
- Improve accessibility for all modes to all users
 -  **Target and Performance Measure:** 50% of communities with Complete Streets policies within 10 years
 -  **Target and Performance Measure:** 50% of available Transportation Improvement Program (TIP) funding allocated to projects that significantly improve bicycle and pedestrian mobility



2.2.4 Goal 4: System Reliability

Goal 4: System Reliability: To improve the reliability of the transportation system.

Objectives

- Provide and maintain fixed route reliability: Miles between breakdown w/ passenger interruption




Chapter 2 – Mission, Goals, Objectives, and Performance Measures

-  **Target and Performance Measure:** Achieve average of 20K miles between breakdowns with passenger interruptions by 2025; and 25K miles by 2040 (from BAT Performance Dashboard)
- Provide and maintain demand response reliability: Miles between breakdown w/ passenger interruption
 -  **Target and Performance Measure:** Achieve average of 10K miles between breakdowns with passenger interruptions by 2025; and 15K miles by 2040 (from BAT Performance Dashboard)
- Provide and maintain highway network travel time reliability
- Protect and strengthen transportation systems vulnerable to climate change through identification of at-risk transportation assets and development of protection measures for each category of asset

2.2.5 Goal 5: Economic Vitality

Goal 5: Economic Vitality: To ensure a transportation system that provides a viable framework for fostering and supporting regional economic development and economic vitality.



Objectives

- Reduce delay along identified freight routes
 -  **Target and Performance Measure:** Address minimum of (2) freight corridors through UPWP every four years
- Improve safety along freight routes
- Mitigate and improve key arterial (such as Route 106) and freeway (Routes 3 and 24) bottlenecks that inhibit efficient freight movement by truck
- Identify opportunities for promoting intermodal freight movement and uses for the Brockton CSX site
- Increase access to major employment centers
 -  **Target and Performance Measure:** Minimum of 2 planning studies in UPWP every 4 years that address access to employment centers
- Increase viaduct clearance to improve freight movement, emergency response, and reduce delay
 -  **Target and Performance Measure:** 100% of underpasses on freight corridors have highway standard vertical clearance by 2040
- Plan and prioritize transportation investments that serve targeted development areas

2.2.7 Goal 6: Environmental Sustainability

Goal 6: Environmental Sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment.



Objectives

- Minimize negative environmental impacts of the transportation system
 -  **Target and Performance Measure:** Program a minimum of 100% of Congestion Mitigation and Air Quality (CMAQ) Program funding targets
- Reduce greenhouse gas emissions and ground level ozone (NOx and VOCs) by all transportation modes
 -  **Target and Performance Measure:** 50% of TIP projects reduce GHGs while also reducing negative impacts on the natural environment (such as improved storm water management or the addition of green space)
- Increase the usage of clean alternative fuels and recyclable material for new transportation infrastructure
- Increase coordination of transportation and housing programs to promote affordable housing near transit
- Develop and support transportation policies that support healthy lifestyles
- Support investments that clean up brownfields and avoid investments that increase pressure to develop greenfields
- Support livable communities and smart growth development patterns through the creation of a balanced multi-modal transportation system

2.2.8 Goal 7: Transportation System Equity

Goal 7: Transportation System Equity: To provide comparable transportation access and service quality across the region regardless of income level or minority population.






Objectives

- Target investments to areas that benefit high percentages of low-income and minority populations
- Maximize benefits and minimize burdens associated with projects in low-income and minority areas.
- Eliminate barriers to participation in the transportation decision making process
 -  **Target and Performance Measure:** Provide translation services and hearing assistance devices upon request for all public meetings, and large font and translation services for all printed materials
 -  **Target and Performance Measure:** Within five years, make recordings of all meetings available on electronic media
- Promote and increase partnerships with other agencies with similar goal and objectives to foster inter-agency collaboration.

2.2.9 Goal 8: Reduced Project Delivery Costs

Goal 8: Reduced project delivery costs. To reduce project costs through a deliberate and thorough project evaluation process at the MPO planning level of project development.

Objectives

- Continue to utilize transportation evaluation criteria in screening potential TIP projects
 -  **Target and Performance Measure:** 100% of all potential projects undergo initial evaluation to determine if project is realistic, viable, and implementable
- Enhanced careening and evaluation of projects to determining Year 1 readiness for TIP
 -  **Target and Performance Measure:** 100% of potential Year 1 TIP projects are screened for implementation readiness
 -  **Target and Performance Measure:** At least 80% of Year 1 TIP Projects are advertised
- Continue to maintain annual participation at TIP Day with MassDOT
 -  **Target and Performance Measure:** 100% attendance and participation at TIP Day
 -  **Target and Performance Measure:** At 25% design stage, work with stakeholders on 100% of potential projects to determine ROW, environmental permitting, and other potential challenges to project development and implementation
- Reduce time of transit contracting

2.3 Performance Measures Identification Process

The 2016 Regional Transportation Plan’s performance measures allow the Old Colony MPO to align its transportation planning program to its long range strategy, and to monitor performance toward strategic objectives over time.

A key responsibility of state and local governments is to develop and manage programs, services, and their related resources as efficiently and effectively as possible and to communicate the results of these efforts to the stakeholders. Performance measurement when linked to the budget and strategic planning process can assess accomplishments on an organization-wide basis. When used in the long-term planning and goals setting process and linked to the entity’s mission, goals, and objectives, meaningful performance measurements can assist government officials and residents in identifying financial and program results, evaluating past resource decisions, and facilitating qualitative improvements in future decisions regarding resource allocation and service delivery.

The following methods and tasks for the transportation targets and performance measure identification process were developed in the 2012 Regional Transportation Plan, and largely utilized for the development of this Plan. Performance measures that were developed in 2012

were reviewed and revised as appropriate, while additional targets and performance measures were developed for this 2016 Plan.

I. Identify Old Colony MPO transportation planning policies that currently lack performance measures.

Task #1: Develop a performance measures planning framework

- Compile and summarize goals, policies, and objectives from the Commonwealth of Massachusetts and MPO transportation plans
- Identify goals and policies currently lacking adequate performance measures
- Conduct transportation performance measure literature search and prepare database of performance measures, classified by policy area, data requirements, and other characteristics.

II. Identify, develop, and recommend multi-modal transportation performance measures that:

- Can be readily implemented by OCPC, and MPO in its planning process, and can utilize current and planned forecasting tools;
- Address relevant local, state, and federal policies;
- Provide useful information to decision makers, help them discern among plan alternatives and investment options, and enable them to consider impacts on both the public in general and on various population segments;
- Allow performance to be measured as well as forecasted;
- Build upon recent research in transportation plan performance measurement; and
- Identify additional research opportunities.

Task #2: Select performance measures for detailed evaluation

- Develop selection and evaluation criteria
- Inventory State and MPO data and models
- Consult with JTC, MPO, MassDOT, FTA, EPA, DEP, and FHWA
- Summarize discussions and input, identify measures to evaluate
- Identify future research needs

III. Test the recommended performance measures using current MPO, OCPC and MassDOT transportation planning models. Evaluate the results.

Task #3: Develop tools to test the selected performance measures

- Develop application procedures, and scripts to evaluate existing MPO scenarios in terms of the selected measures

IV. Prepare final recommended performance measures.

Task #4: Evaluate measures, incorporate into Regional Transportation Plan

3 LIVABILITY IN THE OLD COLONY REGION

The concept of Livability is a top priority for the U.S. Department of Transportation and OCPC. Livability reflects a community’s public safety, housing supply, access to goods and services, mobility, environmental quality, community cohesion, friendliness, aesthetics, accessibility, pride, and opportunity. Livability is an important concept to define and understand because improving livability is a high priority for future transportation planning funding.

There are several techniques that federal, state, regional and local transportation agencies are using to improve livability at the local level. This chapter describes the concept of livability and ways that transportation and land use techniques can improve the well-being of our residents and communities.




Livability is the number one national theme in transportation planning today, and providing adequate guidance in applying livability principals and concepts in the region is one of the Old Colony region’s goals.

This chapter offers an in depth description of local livability examples in the Old Colony region and a list of potential funding opportunities to make our communities more vibrant and sustainable.


3.1 Livability Issues Challenging the Old Colony Region


The Safe Routes to School Program in underutilized in the Region. The Safe Routes to School program (SRTS) aims to reduce congestion, air pollution, and traffic congestion near participating schools, while increasing the health, safety, and physical activity of elementary and middle school students. Currently, 70% of eligible partner schools are partner schools,

 **Target and Performance Measure:** Increase percentage of SRTS Partner Schools to 85% in 10 years. Currently, 70% of eligible partner schools are partner schools


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The Old Colony region is generally automobile dependent. Over the last five or six decades, historic and current land use patterns have created demand for a transportation system designed to accommodate automobiles first and non-motorized uses second. Changing demographics, which include an aging population and a more diverse population that includes a wider variety of people who cannot afford the expense of a personal auto (or who choose not to drive), require better and broader choices in transportation services. Mode shift and inter-modalism can help alleviate auto dependence by increasing the use of transit, carpool/vanpool, and non-motorized transportation modes such as bicycling and walking.

 **Target and Performance Measure:** Achieve 15% of commuters in the Old Colony region using healthy transportation modes (transit, walking, bicycling, etc.) within 10 years


 **Target and Performance Measure:** 50% of communities with Complete Streets policies within 10 years

Bicycle and automobile parking capacity is underperforming in some locations. The need for greater parking capacity for automobiles and bicycles at transit stations, commuter lots, and park and ride lots is growing.

 **Target and Performance Measure:** 100% of intermodal facilities with adequate bicycle parking by 2040

The current ADA accessible sidewalk network does not meet the needs of the users. Most of the main roadways in the region have a sidewalk on at least one side. However, there are many smaller roadways, particularly in more rural areas, where sidewalks are not present. In some cases a worn footpath exists and in others pedestrians share the roadway with vehicles. For existing sidewalks, width, surface type and conditions, and curbing conditions vary. In some cases, sidewalks are in disrepair from weathering and vegetation. The Old Colony MPO is committed to reducing the number and size of gaps in the ADA-accessible sidewalk network.

Access to major employment centers is constrained due to the region's reliance on the automobile. With the automobile being such an integral part of one's day, major employment centers become congested and decrease the quality of life for those people driving to work. A lack of multi-modal accommodations in major employment centers make it difficult for people to make the transition to a different mode of transportation.

 **Target and Performance Measure:** Conduct a minimum of 2 planning studies in the Unified Planning Work Program every 4 years that address access to employment centers

The transit dependent population of the Old Colony region is increasing. With the transit dependent population increasing it is vital that all modes of transportation in the region are available for the residents of each town. The Old Colony MPO is committed

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to improving and expanding human service coordination, mobility, and accessibility for all modes of transportation.

Sprawling land-use patterns continue to be an issue in the Old Colony region. Living near transit stations is the ideal location for commuters that utilize public transportation. A key objective of this Plan is to increase coordination of transportation and housing programs to promote affordable housing near transit. Bicycle and Pedestrian amenities, along with public transportation, help support livable communities. The region supports livable communities and smart growth development patterns through the creation of a balanced multi-modal transportation system.

Greenfield developments continue to be an issue in the Old Colony region. Before the developments on greenfields there should be careful consideration with the cleaning up of brownfields to use for new construction. Developing new land contributes to urban sprawl, the destruction of natural habitats, and increases in greenhouse gasses. An objective of this Plan is to support investments that clean up brownfields and avoid investments that increase pressure to develop greenfields.

Environmental Justice Areas generally have older infrastructure. This older infrastructure often includes poor pavement conditions, lack of ADA compliant sidewalks, and lack of proper crosswalk/bike lane markings. The Old Colony MPO is committed to targeting investments in areas that benefit high percentages of low-income and minority populations along with maximizing benefits and minimizing burdens associated with projects in low-income and minority areas.

3.2 What does livability mean?

While some would suggest that livability means a life that does not require cars, this definition is not applicable to the millions of Americans who have chosen the suburban lifestyle that their communities can offer. Community Livability refers to the environmental and social quality of an area as perceived by residents, employees, customers, and visitors. This includes safety and health (traffic safety, personal security and public health), local environmental conditions (cleanliness, noise, dust, air quality and water quality), access to convenient shopping and services, the quality of social interactions (neighborliness, fairness, respect, community identity, and pride), opportunities for recreation and entertainment, aesthetics, existence of unique cultural and environmental resources (e.g., historic structures, mature trees and traditional architectural styles), and accessible, reliable and affordable transportation options.

Figure 3-1



The photograph above illustrates a successful example of compact village center development in New England that demonstrates some of the livability concepts. This development was designed to accommodate both pedestrians and vehicles for seasonal events. The physical form of this dense mixed-use center supports “tight,” vertical, compact structures while promoting open space activities and streetscape design. Such developments could be constructed as infill developments in town centers or in newly established village center districts that allow for mixed use zoning, walkability, and transit and neighborhood connectivity.



Areas around multimodal stations could support mixed-use development with office, retail, residential, recreational and other uses as shown in the graphic above.

Community livability directly benefits people who live, work or visit an area. It can also increase property values and business activity, and can improve public health and safety. The relationship between livability and transportation is largely affected by the public investment in the community, and creating places where people naturally interact with each other. These public places include streets, parks, trails, transportation terminals, and other shared facilities. All these factors are affected by local public policy and planning decisions.

The desired economic, cultural, and physical diversity of the neighborhoods and communities within the Old Colony region must be reflected in the policies and objectives of the Council. Policies that fail to recognize the diverse needs and lifestyles

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of the population will prevent individuals and groups from working to enhance the opportunities and the quality of life in the community. This philosophy is reflected in the Old Colony MPO’s vision statement, which recognizes the range of transportation options, housing opportunities and lifestyles within its member communities.

“The vision of the Region is to develop compact, livable communities that allow residents to walk, drive, or use transit to reach destinations, that have a mix of uses and a range of housing types and neighborhoods for the diverse needs of its population, and that support developing an employment base to serve the needs of the region”

3.3 Why livability?

Spurred by the prosperity of the post-World War II era and the resulting availability of affordable transportation, Americans began a migration from the cities to the suburbs. Thus began a fundamental shift in land-use development patterns and our sense of place.

The current challenges confronting urban, suburban, and rural communities are reflected by the fact that land is being developed faster than the population is growing. However, it is the way in which land is being developed that causes the greatest issues in transportation. Unorganized extensive, low density development that centers on auto-dependence with no foresight about how the pieces fit together is called sprawl, and it often foreshadows deteriorating quality of life. The inner cities and older inner suburbs are being abandoned, leaving vast areas of infrastructure underused. Rural areas are seeing an erosion of environmental, cultural, and economic values. (Yet to many people, sprawl is an acceptable compromise towards a perceived or desired higher quality of life).

We have continued to take the suburban migration path because our perception is that suburbs have abundant resources such as water and land for housing, and materials for construction to accommodate our expansion. Public policy and laws written in the last 60 years have encouraged this movement and now livability policies are starting to change that way of thinking.

Benefits of Walkable Neighborhoods

Environment – Cars are a leading cause of climate change. Our feet are zero-pollution transportation machines

Health – The average resident of a walkable neighborhood weighs 7 pounds less than someone who lives in a sprawling neighborhood (Pryne, 2006)

Finances – The value of a property is at least \$3,000 higher when the property has pedestrian connectivity (Source: Walk Score)

Communities – Studies show that for every 10 minutes a person spends in a daily car commute, time spent in community activities falls by 10 percent

The role of the livability concept in the new century is to change these policies and encourage the revitalization of downtowns and town centers. The objective is to build livable communities for the future, places where young and old individuals can walk, bike, and play together; where historic neighborhoods are preserved; where farms, forests, and other green spaces are protected; where parents spend less time in traffic and more time with their children, spouses, and neighbors; and where older neighborhoods can thrive once again. Such livable communities will have safe streets, good schools, and public and private spaces that help foster a spirit of community.

Communities can become livable by implementing "smart growth" practices:

- Sustaining prosperity and expand economic growth by building on past investments and preserving prime farm land for agricultural use,
- Enhancing the quality of life by reducing congestion to increase personal time,
- Encouraging redevelopment of centrally located "brownfield" sites (contaminated, abandoned, idled, or under-used commercial, industrial, or institutional properties, where investment for redevelopment or reuse is discouraged by light to moderate contamination from hazardous substances),
- Reducing threats to air and water quality and open space. In order to build livable and sustainable communities, it is essential that local residents, business owners, and government agencies work as partners with a common vision and mutually supporting goals.

In economically challenged times with constrained budgets, transportation funding can be more effective if the focus is on multipurpose projects that support economic revitalization by improving community development, public transportation, and functional bicycling and pedestrian travel. Increasing multimodal mobility, accessibility in denser developments, and reducing the overall costs of moving people, goods, and services, will enhance local economic competitiveness. Transportation investments that support community livability can also have multiple benefits. In terms of transportation, compact and connected communities encourage regular walking, wheeling, and transit

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use, reducing the need for auto travel—while making trips shorter for those who choose to drive. Less driving helps to reduce greenhouse gas emissions (GHGs), and to reduce the nation’s dependence on foreign oil. In terms of land use, compact and connected development patterns require less land and pavement, which reduces storm water runoff, groundwater pollution, and loss of wildlife habitat, fields, and forests.

Adequate land use and transportation policies also have a positive influence on healthy living. The daily exercise associated with more active transportation choices has been recognized to improve human health, reduce obesity and health care costs, and encourage community social interactions. Even those who drive to a mixed-use “park-once” district (or traditional downtown) find they can get exercise and social connections by not having to drive between every destination, given a safe walking and wheeling network.

3.4 Livability Principles

By incorporating livability principles into transportation plans and programs, communities can maximize the efficiency of existing transportation investments while providing better access within and between activity centers. Livability approaches can also be a catalyst for reinvesting in aging suburban corridors, restoring complete streets and networks, and revitalizing rural small towns. A transportation system that provides reliable, safe access to jobs, education, health care, and goods and services is every bit as important to rural communities as it is to urban areas. Rural communities present unique mobility challenges, and the transportation options needed in rural areas can be different in order to ensure access for older individuals to services and activities, and to improve connections and service between communities. Linking transportation investments to compact development and revitalization strategies can preserve natural and cultural resources, while better preparing communities to mitigate and adapt to the impacts of climate change. Making sure that people of all ages have real choices to walk and wheel in the course of daily living, and making communities age-friendly, can support active living, and help improve health and quality of life.

3.4.1 Provide More Transportation Choices

Develop safe, reliable, and economical transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health

Giving people more options for getting around meets many community goals. When people find it easy and safe to walk, bike, or take transit, they no longer have to rely exclusively on cars to get to shops, work, and school. Using transportation modes other than the car helps to reduce air pollution and traffic congestion. Walking and biking also help people to include physical activities in their daily routines, give more freedom to those unable or unwilling to drive, and can reduce household transportation and health costs.



Figure 3-2: BAT Intermodal Centre strategically located next to Downtown Brockton Commuter Rail Station is a great example of providing multiple transportation options in the Old Colony region.

3.4.2 Promote Equitable, Affordable Housing

Expand location and energy efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation

The economic growth of the Old Colony region has new opportunities in areas that are considered high minority census tracts. Some of the Old Colony communities' zoning bylaws and regulations include work force housing as well as elderly housing districts in desired locations. Programs that can be used to create affordable housing in appropriate locations in Massachusetts are Chapters 40B and 40R. Chapter 40B allows local boards of appeal to issue Comprehensive Permits for affordable housing overriding local zoning, and to set appropriate conditions. The permits require at least 25 percent of the housing to be affordable to people making 80 percent or less of the regional median household income while paying no more than 30 percent of income for housing.

Chapter 40R allows a community to rezone a specific area as a "Smart Growth District" allowing very closely-defined uses as-of-right, and any project with more than 12 units has to be at least 20 percent affordable. The majority of these districts are usually walkable and with accessible public transit services.

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Figure 3-3: *Even in the winter, bicycle use is a transportation necessity for some residents in Brockton. Most of Brockton’s work force housing is accessible to a transit route or commuter rail station service.*

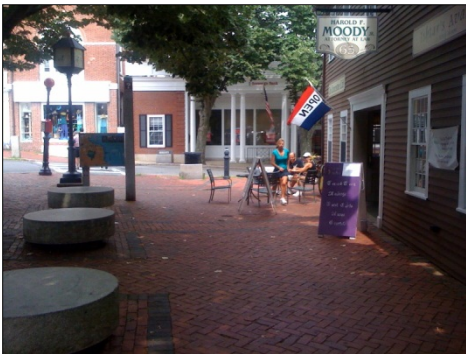


Figure 3-4: *This photograph reflects the human-scale design of Main Street in Plymouth. The width of the sidewalk, mix-use and compact development, historic, cultural and recreational amenities in the center with multiple modes of transportation are some of the attributes that make this particular community an example of a livable community in the Old Colony region.*

The revitalization of downtowns and town centers, and promoting compact developments that emphasize connecting streets, sidewalks, accessible transit, and human-scale design are critical elements of the process for fostering sustainable communities. A community that takes a proactive approach to designing its neighborhoods and activity centers to work effectively with multiple modes of transportation such as transit, walking, bicycles, automobiles, goods movement, and provides options for a wide range of system users such as children, the elderly, individuals with disabilities, business owners, low-income people, and tourists. This fosters greater mobility, and fewer conflicts between land use and transportation, and at the same time it creates a vital community. By supporting development in existing urban areas, communities indirectly protect open space areas and rural landscapes.

3.4.3 Enhance Economic Competitiveness

Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers, as well as expanded business access to markets.

The Old Colony Regional Technology Center Economic Target Area, which includes the towns of Bridgewater, East Bridgewater, Halifax, Hanson, Kingston, Pembroke, Plympton and Whitman, was created by the Old Colony Planning Council and approved by the Massachusetts Economic Assistance Coordinating Council in November, 2010. This

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Economic Target area will help build livable communities by assisting in local business development, job creation, expanding educational opportunities for workers, and expanding business access to markets. The economic growth of the Old Colony Region also has new opportunities in high minority census tracts. For example, the downtown Brockton Transit Oriented Development has contributed to the city’s center by encouraging housing conversion in old mills. The prospect for downtown Brockton is bright and the addition of the Intermodal Centre combined with the MBTA commuter rail service has had a positive effect on the city’s housing and economic development. This is because the confluence of bus lines, major roads, and the rail, make Brockton the easiest place in the region to reach without driving.

3.4.4 Coordinate Policies and Leverage Investment

Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

The interagency partnership between DOT, HUD, and EPA has been developed with the goal of building sustainable communities. Identifying barriers to coordinating transportation, housing, and environmental programs and investments is part of their combined efforts. Building livable communities involves far more than just transportation solutions and has therefore required collaboration across lines of authority and responsibility to leverage related Federal investments.

3.4.5 Value Communities and Neighborhoods

Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods - rural, urban, or suburban

The character of a community is affected by the social, cultural, recreational, and economic activity in neighborhood streets. It involves reducing vehicle traffic volumes and speeds, and creating more attractive street environments to encourage interaction and increase residents’ involvement in their community. It supports compact development with higher density, urban infill, and therefore more efficient land use. These land use components can make neighborhoods more livable and at the same time improve public health by increasing foot traffic and physical activities. Improving street environments and encouraging community interaction by engaging in social and recreational activities along and within streets helps residents and visitors to consider the streets and sidewalks in outdoor living spaces that possess their own character.

3.5 Recommendations

Support “Complete Streets” Design In All Roadway Projects: Complete Streets are roadways that are designed to support safe, attractive, and comfortable access for all users, including motorists, pedestrians, bicyclists, and transit users. In addition to enhancing safety and mobility, “Complete Street” designed roadways often enhance the

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surrounding community and environment through traffic calming techniques and vegetated streetscapes. Complete Streets are categorized by wide paved shoulders or separate bicycling lanes; sidewalks separated from the roadway by raised curbing and/or vegetation; well-placed and well-designed crosswalks; raised medians providing crossing refuge; and bulb-outs at intersections to prevent high-speed turning vehicles and shorten crossing distance for pedestrians.

Support the expansion and enhancement of passenger rail service in the region and improved connections to other regions, including South Coast Rail and extension of daily service to Buzzards Bay: Having multiple transportation choices is a major aspect of livability. Developing policies that ensure equitable distribution of burdens and support multi-modalism in compact development is a way to develop self-sustainable communities. It is vital that residents, as well as engineers, developers, planners and policy makers, understand the role that land-use/transportation planning and day-to-day development decisions have on building quality communities and ensuring equity at the same time.

Support transportation projects that facilitate access to employment and shopping centers, health care, and educational facilities: These projects may include increasing capacity or resurfacing roads, improving safety and traffic flow at intersections, purchasing new vehicles and expanding service by the region’s transit authorities, improving bicycle and pedestrian facilities, and enhancing train stations and intermodal facilities.

Support the Commonwealth’s Sustainable Development Principles: The State has developed these principles to concentrate development and mix uses, advance equity, make efficient decisions, protect land and ecosystems, use natural resources wisely, expand housing opportunities, provide transportation choice, increase job and business opportunities, promote clean energy, and plan regionally.

Use traffic calming techniques to protect neighborhoods in mixed use areas: Implementing traffic calming techniques will provide a safer travel environment for all users. Some traffic calming techniques include roundabouts, traffic circles, raised medians, road humps, speed tables, and rumble strips. The narrowing of lanes and the widening of sidewalks is another traffic calming technique that eases crossing for pedestrian and gives them more space to walk.

Support MassDOT’s Healthy Active Transportation Policy Directive: The Healthy Transportation Policy Directive was issued to ensure all MassDOT projects are designed and implemented in a way that all customers have access to safe and comfortable healthy transportation options at all MassDOT facilities and in all the services MassDOT provides. Healthy transportation modes as defined by GreenDOT are walking, bicycling and transit.

4 PROFILE OF THE OLD COLONY REGION

The Old Colony region consists of the following sixteen communities in Southeastern Massachusetts: Abington; Avon; Bridgewater; Brockton; Duxbury; East Bridgewater; Easton; Halifax; Hanson; Kingston; Pembroke; Plymouth; Plympton; Stoughton; West Bridgewater; and Whitman.

4.1 Population and Development Issues Challenging the Region

The following describe some of the challenges planners and agencies face related to the socio-economic characteristics and development patterns in the region.

The Old Colony region is automobile dependent. While efforts have been made and some progress has been seen in promoting smart growth around transit hubs in the region, much of the region is characterized by typical suburban development developed with sprawling commercial development along state numbered highways that feed residential neighborhoods primarily developed with single family homes.

The transit dependent population of the Old Colony region is increasing. The percentage of the population in the region over the age of 65 years old has risen consistently over the past couple of decades, and is forecast to increase further. As the population ages, a greater percentage of the population will become dependent on transit (both fixed route and demand response) for access to essential life services and everyday living.

A high percentage of the population continues to drive alone for commuting and daily trips. Data suggest that over 4 out of every 5 people in the Old Colony region are using a personal vehicle and driving alone in their daily commutes.

4.2 The 2010 Census

Much of the population, housing, and economic data presented in this Regional Transportation Plan and other planning documents prepared in this Plan are obtained from the United States Census Bureau. The Census Bureau conducts its official national census every ten years, most recently in 2010.

4.3 Existing Population Characteristics

Table 4-1 contains the most official Census 2010 population figures for the communities of the region and the Commonwealth of Massachusetts, along with a summary of growth since 2000 and population densities as of 2010.

Chapter 4 – Regional Profile

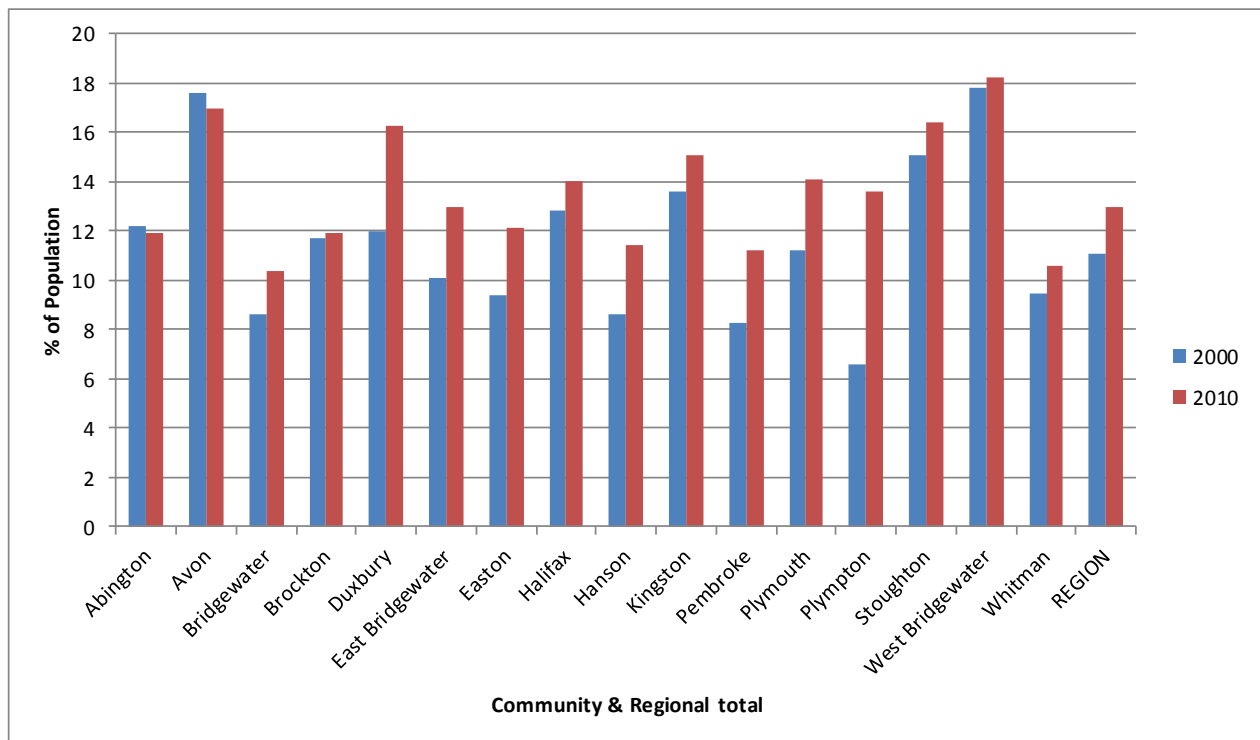
Table 4-1: 2000 Census, Recent Population Growth, and Population Density

	Recent Population Growth				Population Density	
	Census 2010	Census 2000	% Growth 2000-2010	Annual % Growth	Land Area (Sq. Miles)	Density in 2000 (Pop/ Sq. Mile)
Abington	15,985	14,605	9.45%	0.91%	10	1,615
Avon	4,356	4,443	-1.96%	-0.20%	4.4	990
Bridgewater	26,563	25,185	5.47%	0.53%	27.5	966
Brockton	93,810	94,304	-0.52%	-0.05%	21.5	4,363
Duxbury	15,059	14,248	5.69%	0.56%	23.8	633
East Bridgewater	13,794	12,974	6.32%	0.61%	17.2	802
Easton	23,112	22,299	3.65%	0.36%	28.4	814
Halifax	7,518	7,500	0.24%	0.02%	16.1	467
Hanson	10,209	9,495	7.52%	0.73%	15	681
Kingston	12,629	11,780	7.21%	0.70%	18.5	683
Pembroke	17,837	16,927	5.38%	0.53%	21.8	818
Plymouth	56,468	51,701	9.22%	0.89%	96.5	585
Plympton	2,820	2,637	6.94%	0.67%	14.8	191
Stoughton	26,962	27,149	-0.69%	-0.07%	16	1,685
West Bridgewater	6,916	6,634	4.25%	0.42%	15.7	441
Whitman	14,489	13,882	4.37%	0.43%	7.0	2,070
OCCPC Region	348,527	335,763	3.80%	0.37%	354.1	984
Massachusetts	6,547,629	6,349,097	3.13%	0.31%	7,840.0	835

4.3.1 Older Persons

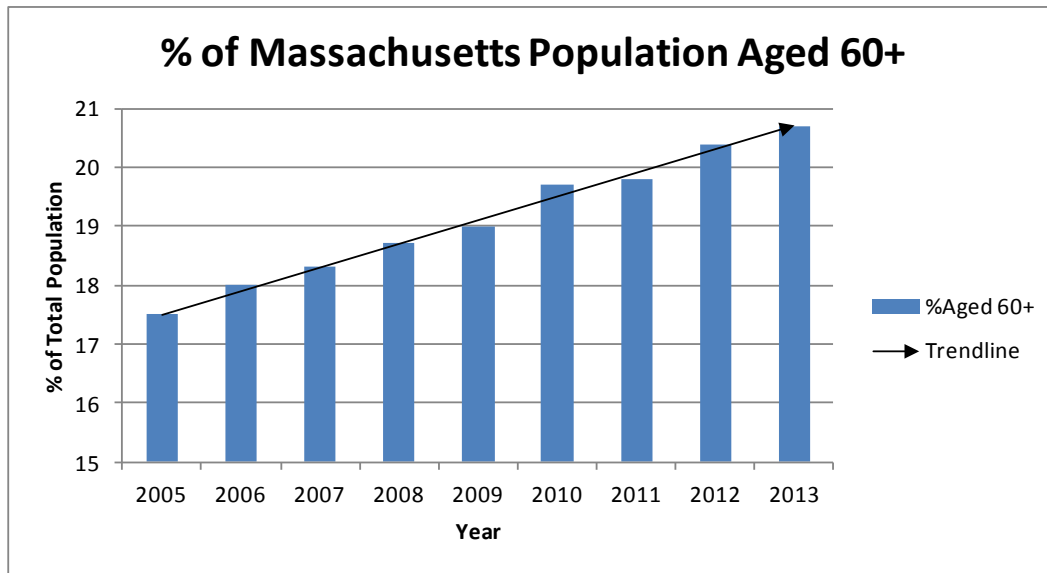
The population of the region, similar to state and national trends, is getting older with an increasing percentage of the population aged 65 and over. From the 2010 Census, 13 percent of the population of the Old Colony region was 65 or older, a percentage that has risen consistently since 1970 and up nearly 2 percentage points from 11.1 percent in the 2000 Census. The chart in Figure 4-1 shows the percentage of population aged 65 or older by community and the region in 2000 and 2010. Figure 4-2 illustrates how the percentage of persons aged 60 and over in the state has risen consistently since 2005, while the map in Figure 4-3 indicates where the most significant concentrations of older persons reside in the Region.

Figure 4-1: Percent of Population Aged 65 or Older



Other trends in recent years have shown many elder persons choosing to stay in their own suburban homes rather than opting for a specific community or facility that caters to their physical and social needs. Similarly, people are generally working later in life than in past generations, further emphasizing the transportation needs for this segment of the population.

Figure 4-2: Statewide Increasing Trend on Percent of Population 60 and Over



The Federal Highway Administration (FHWA) in Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians cites results of a survey that identifies specific challenges faced by older Americans while driving. For example, crash analyses and observational studies indicated the following factors in intersection crashes involving older drivers:

- 27 percent had difficulty reading road signs
- 21 percent had difficulty driving across an intersection
- 20 percent had difficulty finding the beginning of a left turn lane
- 19 percent had difficulty making a left turn
- 17 percent had difficulty following pavement markings
- 12 percent had difficulty responding to traffic signals

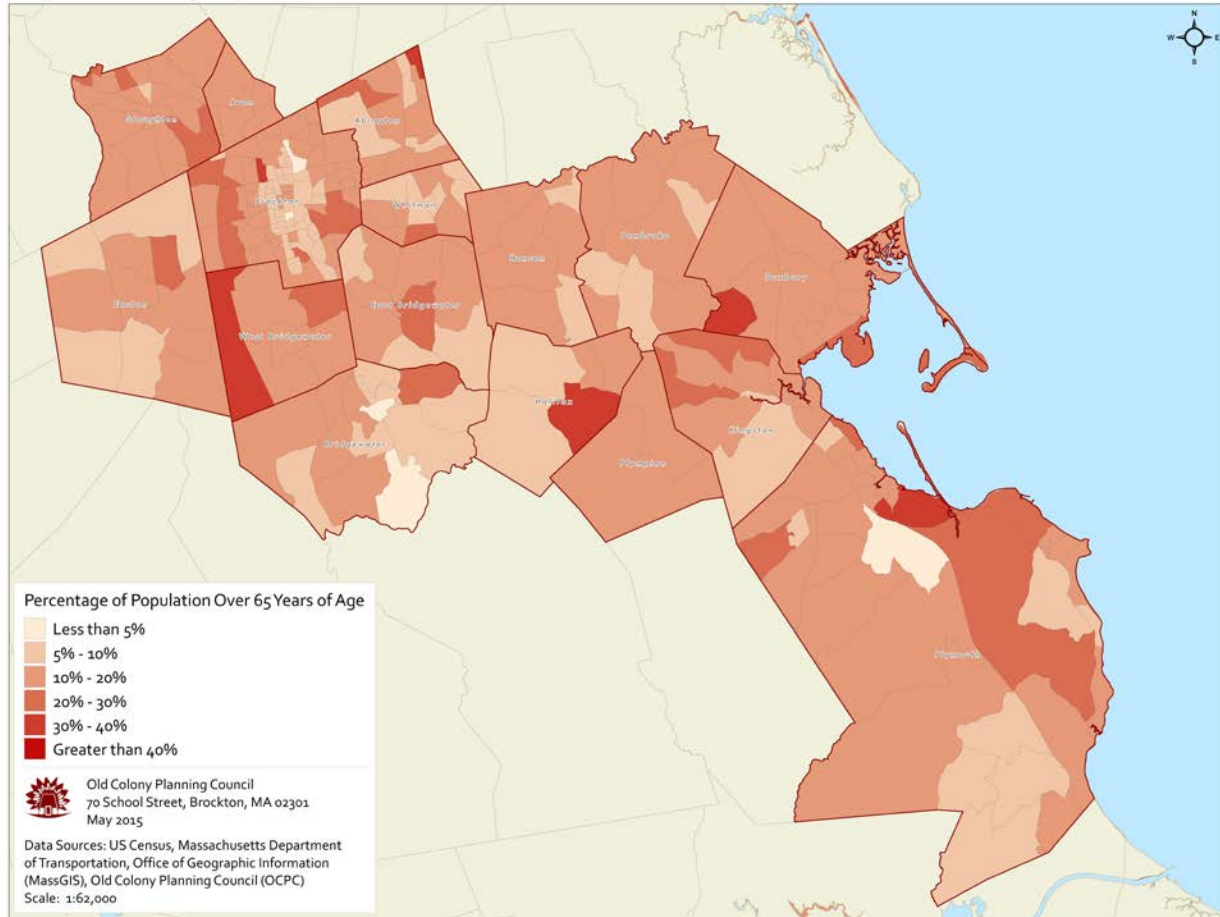
The same study also yielded the following results of a survey given to older drivers to identify highway features more important to them for safe driving as they grow in age:

- Lighting at intersections (62 percent)
- Pavement markings at intersections (57 percent)
- Number of left turn lanes at an intersection (55 percent)
- Width of travel lanes (51 percent)
- Raised-curb channelization for turns at intersections (47 percent)
- Size of traffic signals at intersections (42 percent)

Planning for the transportation needs of the older drivers of today and tomorrow must be a priority for planners and government entities.

Figure 4-3: Population of Older Persons

Population: Age 65 and Older



4.3.2 Environmental Justice and Title VI Populations

Achieving environmental justice and compliance with Title VI of the Civil Rights Act of 1964 is a priority of the Old Colony Metropolitan Planning Organization. This is achieved by taking steps to ensure the effects of all programs, policies, and activities on minority populations and low-income population are identified and addressed in the transportation planning process. There are three fundamental environmental justice principles that are employed in the process:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

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Federal legislation requires MPOs:

- Enhance their analytical capabilities to ensure that the long-range transportation plan and the transportation improvement program (TIP) comply with Title VI.
- Identify residential, employment, and transportation patterns of low-income and minority populations so that their needs can be identified and addressed, and the benefits and burdens of transportation investments can be fairly distributed.
- Evaluate and - where necessary - improve their public involvement processes to eliminate participation barriers and engage minority and low-income populations in transportation decision-making.

The Old Colony Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of **race, color, or national origin** (including **limited English proficiency**), be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of **age, sex, and disability**. These protected categories are contemplated within the Old Colony MPO's Title VI Programs consistent with federal interpretation and administration. Additionally, the Old Colony MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with US Department of Transportation policy and guidance on federal Executive Order 13166.

The Old Colony MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 §§ 92a, 98, 98a, prohibiting making any distinction, discrimination, or restriction in admission to or treatment in a place of public accommodation based on **race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry**. Likewise, the Old Colony MPO complies with the Governor's Executive Order 526, section 4 requiring all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on **race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status** (including Vietnam-era veterans), or **background**.

Figures 4-4 (Non-White Population by Block Group) and 4-5 (Low Income Population by Block Group) show the environmental justice populations within the Old Colony Region, based on Census 2010 Block Group data. Table 4.2 contains the 2010 Census data on race, by community.

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**Table 4-2
Population by Race in OCPC Region, 2010 Census**

	Total Population	Race								
		One Race							Two or More Races	Hispanic or Latino
		Total	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian and Other Pacific	Other		
Abington	15,985	15,766	14,788	342	47	284	2	303	219	310
Avon	4,356	4,284	3,660	434	5	120	0	65	72	121
Bridgewater	26,563	26,139	24,163	1,292	62	328	0	294	424	838
Brockton	93,810	87,327	43,821	29,276	332	2,151	52	11,695	6,483	9,357
Duxbury	15,059	14,936	14,649	62	16	149	2	58	123	184
East Bridgewater	13,794	13,593	13,139	216	28	117	0	93	201	204
Easton	23,112	22,733	21,144	745	20	563	5	256	379	575
Halifax	7,518	7,409	7,291	45	6	42	0	25	109	81
Hanson	10,209	10,069	9,850	104	3	48	1	63	140	95
Kingston	12,629	12,467	12,137	133	14	116	1	66	162	140
Pembroke	17,837	17,664	17,274	109	29	170	3	79	173	193
Plymouth	56,468	55,482	52,955	1,147	193	516	22	649	986	1,030
Plympton	2,820	2,793	2,731	24	8	22	0	8	27	36
Stoughton	26,962	26,267	21,634	2,984	46	971	2	630	695	876
West Bridgewater	6,916	6,817	6,564	104	7	75	0	67	99	121
Whitman	14,489	14,249	13,768	180	35	111	5	150	240	267
OCPC Total	348,527	337,995	279,568	37,197	851	5,783	95	14,501	10,532	14,428
Massachusetts	6,547,629	6,375,626	5,265,236	434,398	18,850	349,768	2,223	305,151	172,003	627,654
OCPC % of State	5.32%	5.30%	5.31%	8.56%	4.51%	1.65%	4.27%	4.75%	6.12%	2.30%

Figure 4-4: Population of Non-White Persons by Block Group, 2010 Census

Population of Non-White Persons

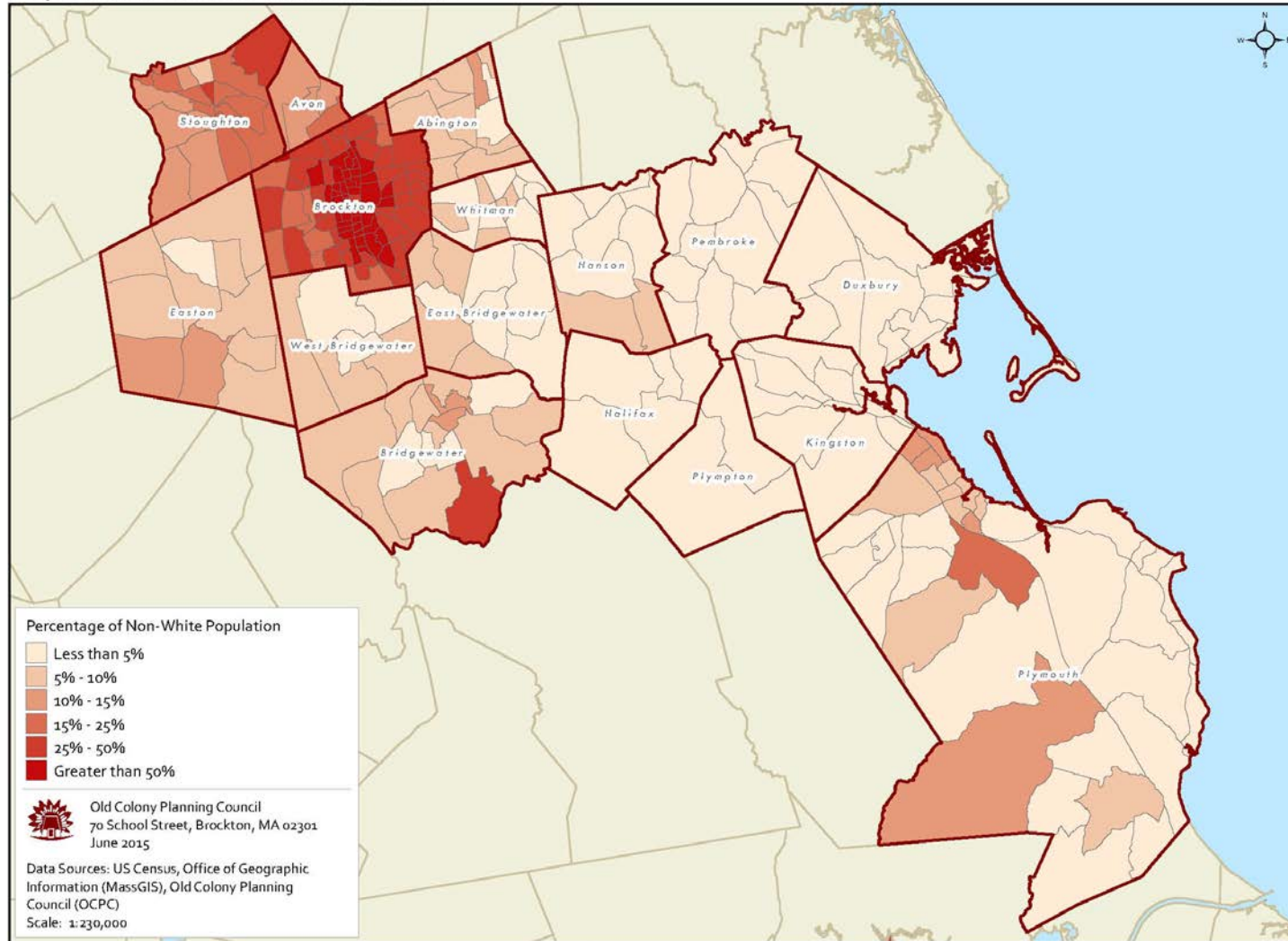
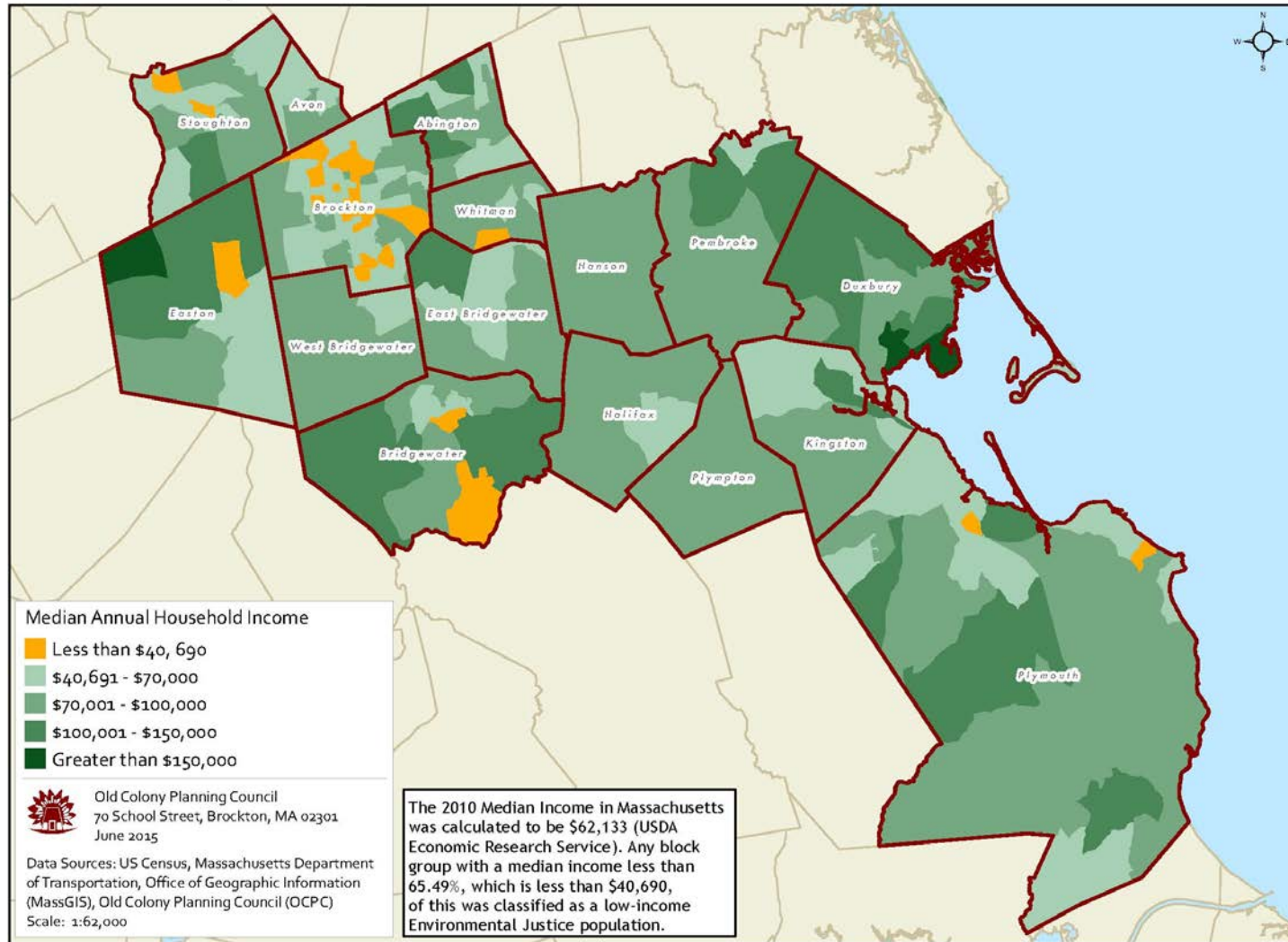


Figure 4-5: Low-Income Population by Block Group, 2010 Census

Low-Income Population



4.4 Existing Land Use

Overall, the Old Colony region is characterized by typical “bedroom community” development patterns with single family homes on residential plots of land and commercial (typically retail and service based) development clustered around highway interchanges, along state numbered roadways, and in town centers. Land use and development patterns in the region are monitored through the Old Colony Land Use Management System (LUMS).

4.4.1 Old Colony Regional Land Use Management System (LUMS)

As one of the fastest growing areas in the state, Southeastern Massachusetts has seen continued development despite the most recent economic downturn. The Old Colony Land Use Management System (LUMS) is used to track changes in land use across the Old Colony region. In coordination with local municipal officials and research, staff members have identified a multitude of projects within the region that have major impacts on the region’s land use.

The projects identified in the LUMS are categorized two ways: by their status-(proposed, under construction or completed), and by their class-(commercial, educational, institutional, industrial, medical, municipal, recreational or residential). With the accompanying maps, one can identify areas where development is occurring in each community of the region.

4.4.2 The Old Colony Land Use Monitoring System

The Old Colony Land Use Management System (LUMS) tracks both new and existing developments in order to examine the land use patterns in the region. All types of development, whether large or small, highway corridor/automobile oriented or transit and pedestrian oriented, have an impact on transportation. Large projects have the obvious impact of introducing large amounts of travel demand, usually in the form of vehicular traffic, in a geographic area during specific times and days. Small developments, such as small shopping plazas or residential subdivisions, do not necessarily create large demands in a short time period; however, their cumulative impacts over time do significantly affect the travel demands and vehicular traffic within a given community or geographic area. Additionally, monitoring the changes in land use supports local governments in their efforts to develop land use plans, refine local regulations, and manage land use patterns within a dynamic urban, suburban, or rural environment.

4.4.3 The Land Use Monitoring Process

In order to compile and monitor information on developments in the area, Old Colony created a land use database that is centrally located on the agency server, which is easily accessed by staff members. The database currently includes 1,548 projects.

The development of the land use database has been achieved through coordinating the responsibilities of Old Colony staff. Old Colony staff members regularly review and comment on projects that undergo the Massachusetts Environmental Protection Act (MEPA) review process in regards to impacts to infrastructure (traffic, storm water, wastewater, and water resources). In addition, staff responsibilities include support of member communities regarding

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land use, zoning and project site plan review. Information on development projects is presented to the Old Colony Planning Council, the Old Colony Metropolitan Planning Organization, and the Old Colony Joint Transportation Committee.

The Land Use Management Systems report summarizes region-wide development and lists developments by community. It should be noted that impacts to the region include positive impacts, such as tax revenue, expanded employment and economic opportunities, as well as negative impacts on the infrastructure, such as increased traffic and demands on water resources and wastewater treatment capacity.

4.5 Commuting Patterns and Mode Shift

Commuting patterns and mode shift are monitored through a variety of sources and methodologies, including but not limited to data from the Census Bureau and American Community Survey, the MassDOT Massachusetts Travel Survey, physical traffic counts, and surveys of park and ride facilities across the region.

American Community Survey Commute to Work Data

The United States Census Bureau releases estimates on mode of commute for the labor force by community, based on results of the American Community Survey. The most recent available ACS data at the time of the development of this RTP was from 2013. The data in Table 4-3 lists the number of workers over 16 in each community in the Old Colony Region; how they commute to work; and the mean commute time for the community. While a very large percentage of the employed population continues to drive alone in a personal car or truck, other forms of transportation including carpooling and transit are becoming increasingly popular. With a mean commute time of 28.5 minutes, residents of West Bridgewater have the shortest commute in the region, while at 37.3 minutes residents of Duxbury had the longest commute.

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Table 4-3: Mode of Commute and Mean Commute Time, 2013

Community	Mode of Commute							Mean Commute Time (minutes)	% Driving Alone	% Using Alternative
	Workers Over 16	Drove Alone	Carpool	Public Transportation	Other Walked	Other Means	Work At Home			
Abington	8,207	6,882	368	647	116	33	161	31.0	83.86%	16.14%
Avon	2,373	1,989	233	71	32	13	35	27.1	83.82%	16.18%
Bridgewater	12,730	9,898	799	529	852	99	553	31.6	77.75%	22.25%
Brockton	40,538	31,457	4,196	2,727	1,037	460	661	29.8	77.60%	22.40%
Duxbury	6,679	5,307	239	337	57	87	652	37.3	79.46%	20.54%
East Bridgewater	7,351	6,320	529	227	16	33	226	31.5	85.97%	14.03%
Easton	12,027	9,635	717	433	452	23	767	32.1	80.11%	19.89%
Halifax	3,861	3,405	183	235	0	0	38	33.8	88.19%	11.81%
Hanson	5,382	4,631	298	220	41	12	180	33.3	86.05%	13.95%
Kingston	6,319	5,384	310	247	25	22	331	32.6	85.20%	14.80%
Pembroke	9,558	7,846	805	347	41	44	475	34.1	82.09%	17.91%
Plymouth	27,956	22,407	2,388	988	642	310	1,221	33.4	80.15%	19.85%
Plympton	1,453	1,237	74	37	39	0	66	32.3	85.13%	14.87%
Stoughton	14,342	11,697	1,047	775	239	111	473	31.6	81.56%	18.44%
West Bridgewater	3,326	2,557	286	195	81	65	42	28.5	76.88%	20.11%
Whitman	7,880	6,598	664	310	74	57	177	30.7	83.73%	16.27%
Region	169,982	137,250	13,136	8,325	3,744	1,369	6,058	n/a	80.74%	19.20%

Figures presented here are estimates based on the 2013 American Community Survey, and published by the US Census Bureau

Massachusetts Travel Survey

The Massachusetts Travel Survey (MTS) was a large-scale effort (the first since 1991) that collected information on residents' travel patterns, preferences, and behavior to help build a fuller, more accurate picture of transportation needs. This MassDOT project is providing the data necessary to define travel patterns on the Commonwealth's highway and transit networks. This data is used for projections of expected future highway traffic and transit ridership throughout the state. The information that has been gathered will help MassDOT to prioritize its investments, and was also part of federal requirements to ensure compliance with air quality standards in Massachusetts.

Between June 2010 and November 2011, MassDOT contractors asked over 15,000 households to identify where and how they traveled on a specific, designated travel day (24 hours). In order to ensure a sample that was representative of the Massachusetts population, each household was asked a series of detailed questions about their socioeconomic characteristics and access to transportation.

The MTS was completely confidential for participants, as personal identifying information was separated from all responses collected before the results were provided to MassDOT. Table 4-4 illustrates the results of the Massachusetts Travel Survey of commuters within the Old Colony region.

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Table 4-4: Mode Shift over Time, 1990 – 2010

Mode of Commute	# of Commuters (Region-Wide)			# of Commuters (Region-Wide)		
	1990	2000	2010	1990	2000	2010
Drove alone	114,850	125,410	135,998	81.5%	81.7%	84.3%
Carpooled	16,623	15,383	8,095	11.8%	10.0%	5.0%
Public transit	5,182	9,581	12,393	3.7%	6.2%	7.7%
Motorcycle	110	93	287	0.1%	0.1%	0.2%
Bicycle	209	167	1,007	0.1%	0.1%	0.6%
Walked	3,955	2,895	3,502	2.8%	1.9%	2.2%
TOTAL	140,929	153,529	161,282	100.0%	100.0%	100.0%
2010 Massachusetts Travel Survey carpooled includes taxi and auto, van, truck passenger						

4.6 Future Growth and Development

The Massachusetts Department of Transportation in a joint effort with the Metropolitan Area Planning Council (the Boston MPO), the Boston MPO staff, and the University of Massachusetts Donahue Institute (UMDI) have developed statewide, regional, and municipal level population and economic forecasts through 2040. These forecasts were developed using a comprehensive land use model to best determine where development will occur and to what magnitude. Census 2010 data was used as the baseline for the model. Overall, a total 7 percent increase in population and 10.86 percent increase in employment from 2010 figures are forecast for the region.

Table 4-5 contains the statewide, regional, and community level forecasts generated by MassDOT while Table 4-6 contains employment forecasts.

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Table 4-5 – Population Forecasts Through 2040

	2010	Forecast Year			% Increase 2010 - 2040
	Census	2020	2030	2040	
Massachusetts	6,547,629	6,798,770	7,059,629	7,203,380	10.02%
OCPC Region	348,527	361,527	372,470	372,907	7.00%
Abington	15,985	17,730	19,470	20,382	27.51%
Avon	4,356	4,364	4,380	4,327	-0.67%
Bridgewater	26,563	27,055	27,619	27,456	3.36%
Brockton	93,810	96,651	98,536	97,886	4.34%
Duxbury	15,059	15,140	15,434	15,472	2.74%
East Bridgewater	13,794	14,492	15,057	14,967	8.50%
Easton	23,112	23,149	23,123	23,019	-0.40%
Halifax	7,518	7,509	7,486	7,448	-0.93%
Hanson	10,209	10,734	11,237	11,351	11.19%
Kingston	12,629	13,347	14,283	14,630	15.84%
Pembroke	17,837	18,345	18,773	18,622	4.40%
Plymouth	56,468	60,929	64,182	64,342	13.94%
Plympton	2,820	2,887	2,910	3,002	6.45%
Stoughton	26,962	27,060	27,180	27,209	0.92%
West Bridgewater	6,916	7,172	7,471	7,559	9.30%
Whitman	14,489	14,963	15,329	15,235	5.15%


Table 4-6: Employment Estimates Through 2040


	2010	Forecast Year			% Increase 2010 - 2040
	Employment	2020	2030	2040	
Massachusetts	3,092,231	3,362,346	3,370,552	3,325,416	7.54%
OCPC Region	133,273	146,709	146,434	147,745	10.86%
Abington	4,032	4,684	4,665	4,706	16.72%
Avon	5,178	5,377	5,339	5,390	4.09%
Bridgewater	8,025	9,084	9,031	9,119	13.63%
Brockton	37,160	38,180	37,906	38,278	3.01%
Duxbury	3,563	3,575	3,558	3,595	0.90%
East Bridgewater	2,975	3,485	3,480	3,505	17.82%
Easton	10,440	10,700	10,637	10,739	2.86%
Halifax	1,431	1,457	1,450	1,463	2.24%
Hanson	2,158	2,143	2,137	2,151	-0.32%
Kingston	5,570	7,773	7,755	7,808	40.18%
Pembroke	4,987	5,018	5,003	5,041	1.08%
Plymouth	23,807	28,234	28,148	28,370	19.17%
Plympton	393	1,125	1,121	1,131	187.79%
Stoughton	13,777	14,989	15,374	15,512	12.59%
West Bridgewater	7,096	8,158	8,124	8,197	15.52%
Whitman	2,681	2,727	2,706	2,740	2.20%

4.7 Conclusion and Recommendations


Continue to screen all projects for benefits and burdens analysis as it pertains to minority populations and low-income populations. All Old Colony MPO programs and activities, along with transportation projects funded through the Transportation Improvement Program (TIP), will continue to undergo thorough and comprehensive screening to determine benefits and burdens to minority populations and low-income populations. Efforts will be made to target investments that benefit areas with low-income and/or minority populations, ensuring these populations have access to essential life services, and avoiding or mitigating disproportionately high and adverse human health and environmental effects, including social and economic effects on these populations.


Eliminate barriers to participation in the decision making process. The Old Colony Metropolitan Planning Organization will continue to take steps to eliminate barriers to participation in the transportation planning and decision making process. These efforts will include providing upon request translation services to those with limited English proficiency, hearing assistance devices, and large font and translation services for all print materials.

 **Target and Performance Measure:** Provide translation services and hearing assistance devices upon request for all public meetings, and large font and translation services for all printed materials

 **Target and Performance Measure:** Within five years, make recordings of all meetings available on electronic media

Support livability and sustainable development initiatives and planning policy that enable the population to choose healthy transportation modes over personal, single occupant vehicles for daily trips and subsequently aid in achieving mode shift goals. Comprehensive regional planning and transportation planning activities through the Old Colony Metropolitan Planning Organization will continue to incorporate principles that encourage livability and sustainable development, such as those listed in the Commonwealth's 10 Sustainable Development Principles. Future new development and redevelopment of existing facilities must be conducted in a responsible manner that fosters improved connections and a reduction on reliance of the personal automobile for daily trips.

 **Target and Performance Measure:** 50% of communities in the Old Colony region have Complete Streets policies within 10 years

 **Target and Performance Measure:** Achieve 15% of commuters in the Old Colony region choosing healthy transportation modes to the automobile within 10 years

Enhance planning efforts to plan for the transportation needs of an aging population. Transportation planning activities will incorporate the needs of elderly persons and individuals with disabilities, including ensuring access to essential life services. Efforts will be made to increase and improve coordination between transportation planners and agencies reserving and representing the needs of the elderly and individuals with disabilities.

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Increase accessibility at the neighborhood scale. One approach is to use the Subdivision Rules and Regulations to encourage pedestrian and bicycle ways to connect cul-de-sacs and local streets in subdivisions to one another and to nearby schools, stores and other destinations.

Foster Healthy Communities and Neighborhoods By Supporting The Healthy Transportation Compact (HTC) and GreenDOT Initiatives. Healthy communities and neighborhoods can be achieved through supporting these State initiatives on the local level within the region.

Increase transit accessibility to underserved, employment centers. Efforts will be made that may enable extending fixed-route and demand response transit service to employment centers such as industrial parks and major commercial developments. Existing industrial areas and other employment centers whose locations and configuration allow the feasibility for expanded transit options will be encouraged as locations for future development and redevelopment.

Support a Vibrant Downtown Plymouth and Waterfront Area, Including an Intermodal Transportation Center: Support increased commuter rail service to the Plymouth Station at Cordage Park, and connections between the station and the Waterfront/Downtown Area including enhanced pedestrian and bicycle connections featuring extension of the Plymouth Seaside Trail, in addition to supporting existing transit connections between Cordage Park and the Waterfront. An intermodal transportation hub located within the Waterfront/Downtown area could greatly improve mobility and accessibility in the area, as well as support surrounding economic development.

5 THE CHANGING HIGHWAY SYSTEM

According to the Massachusetts Travel Survey conducted in 2010 and 2011 by the Massachusetts Department of Transportation (MassDOT), there is a heavy reliance on the automobile for basic travel in Massachusetts. Over 15,000 households were surveyed (over 37,000 persons), and nearly 69 percent of all recorded trips were done by automobile, while just fewer than 8 percent were done by transit and just over 20 percent were considered non-motorized.



Figure 5-1: Interchange Development in Pembroke

The Old Colony region is heavily dependent on the personal automobile for transportation, much like the rest of the state. Many of the highways and roads within the Old Colony regional highway network have been transformed within the past six or seven decades due to residential, retail, and industrial growth. The historical function of the region's roads has been to provide a regional connection between communities and to provide a connection between the rural areas and the towns and cities. As residential, retail, and employment areas became more dispersed due to dependency on the automobile, the function of the roads within the network has become more dynamic and complex. Many of the major highway corridors within the region serve as retail destinations as well as heavy commuter corridors (see Figure 5-1). As a result, these traditional regional highways have become congested due to bottlenecks within town centers, the lack of proper access management, and, most importantly, the lack of multi-modal accommodations. The reliance on the automobile has created a transportation system devoted to motor vehicle travel; however, Massachusetts is at the forefront of the effort to change that trend.

5.1 Federal and State Policies and Guidelines

Federal guidelines for the Regional Transportation Plan require that the plan reflect local and state goals, as well as national goals and objectives. MassDOT, in its transportation impact review process, and in its project development process, advances a number of policies, goals, and objectives included in MassDOT's Project Development and Design Guide standards on

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Complete Streets, the Global Warming Solutions Act, the Massachusetts GreenDOT Policy Initiative, the Mode Shift Initiative, the Healthy Transportation Compact, the Healthy Transportation Policy Directive, the Massachusetts Ridesharing Regulation, and the Safe Routes to School program. The Massachusetts Department of Transportation’s GreenDOT policy (established in 2010) is a comprehensive environmental responsibility and sustainable initiative, which integrates sustainability principles into all aspects of the way MassDOT plans, designs, builds, and operates the transportation system. GreenDOT policy aims to reduce greenhouse gas (GHG) emissions, promote healthy transportation options (walking, bicycling, and public transit), and support smart growth development.

Old Colony’s development of goals, objectives, plans, and projects, as well as its transportation review (MEPA) process, supports and advances MassDOT policies and goals as outlined in its statutes, directives, guidelines, and standards.

In addition, in 2012, MassDOT announced a visionary statewide mode shift goal of tripling the share of travel in Massachusetts by bicycling, transit and walking between 2010 and 2030. Making other modes absorb the current and future travel demand preserves the capacity of the highway network, protects the natural environment, and improves public health. This multi-agency approach to incorporating environmental responsibility and stewardship is a key component in preserving the reliability of the regional transportation system while creating a more sustainable place to live.

5.2 Issues Facing the Old Colony Region Highway System

The Old Colony region is generally auto-dependent. Over the last six decades, historic and current land use patterns have created demand for a transportation system designed to accommodate automobiles first and non-motorized uses last. Changing demographics, which include an aging population and a more diverse population that includes a wider variety of people who cannot afford the expense of a personal auto (or who choose not to drive), require better and broader choices in transportation services. Mode shift and inter-modalism can help alleviate auto dependence by increasing the use of transit, carpool/vanpool, and non-motorized transportation modes such as bicycling and walking.

Town centers in the region were not designed to accommodate current demand and create bottlenecks and congestion. Successful town centers are typically places where town government offices, retail shops, restaurants, financial services, and residences coexist. They offer a place where residents and visitors can easily park and spend time performing necessary functions as well as enjoying recreational opportunities. Many town centers in the Old Colony region struggle with high traffic volumes and a lack of multi-modal accommodations which in turn creates challenges providing a vibrant and resilient place for all users. A change in zoning and land use that allows for more mixed uses, especially in and around traditional town centers, will help encourage mode shift and develop and support policies that support healthy life styles.

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The Old Colony region’s highway network has numerous areas that demonstrate congestion, create excessive delays, and exhibit circulation problems. Numerous limited access highway interchanges, town centers, and densely developed highway corridors in the Old Colony region suffer from daily congestion and have serious circulation issues due to the lack of proper access management techniques, effective transportation demand management applications, proper traffic control, and a lack of multi-modal accommodations.

Carpooling rates in the Old Colony region continue to be low. Residents in the Old Colony region continue to rely on the automobile for their primary way of getting from place to place. Commuter rail transit service and state owned park and ride facilities are provided in the region; however, their utilization is still low compared to other parts of the Commonwealth.

Freight movement on the regional highway network is impacted by recurring bottlenecks as well as the physical constraints. Trucking is the primary mode utilized for the movement of goods in the Old Colony region and there are a number of challenges that include operational constraints as well as physical constraints within the region’s highway network. Recurring bottlenecks, poor intersection turning radii, height and weight restrictions, and lack of limited access highway acceleration and deceleration lanes inhibit the movement of goods and reduce the highway network travel time reliability in the Old Colony region.

The sub-standard design of the limited access highways and interchanges in the Old Colony region limit the ability of the infrastructure to handle the current traffic demand. Peak hour bottlenecks and heavy commuter traffic volumes occur on a daily basis on Route 3 (Pilgrim Highway) and Route 24 (AmVets Memorial Highway) due to their sub-standard design. Specifically, motorists are allowed to use the breakdown lane on Route 3 during the morning and afternoon peak periods in order to provide additional capacity and the majority of the interchange ramps, deceleration ramps, and acceleration ramps are undersized.

There are more roads in the Old Colony region with a “fair” or “poor” pavement condition rating than those with a “good” or “excellent” rating. Currently, the “Fair” and “Poor” categories total 63 percent of the total amount of federal aid roads while the “Good” and “Excellent” categories total 37 percent. A pavement system in disrepair increases delays, restricts freight movement, and inhibits economic vitality.

There are several bridges in the Old Colony region that have been identified as structurally deficient. According to the MassDOT bridge database, there are six bridges in the Old Colony region identified as structurally deficient. Bridges play a vital role in the highway network providing links over natural obstacles such as rivers and streams and enhancing the efficiency of the network.

The Old Colony regional highway network contains areas vulnerable to the effects of climate change. The roads and bridges in the Old Colony region are considered some of the oldest in the country and when combined with severe weather events, this infrastructure is susceptible to major damage. The most immediate impact of more intense precipitation is the increased

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flooding of bridges and roads, especially those near the coastline and those located within 100 & 500 Year Flood Zones. Although the impact of sea level rise is limited to coastal areas, the effect of intense precipitation on land transportation infrastructure and operations is more widespread.

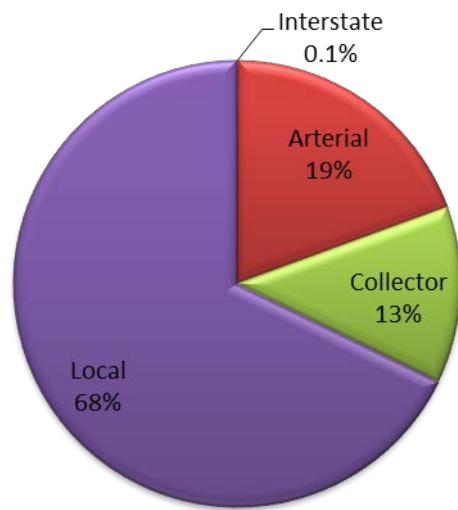
The cost of transportation improvement projects continue to rise. Delays in the project development and delivery process can increase project costs. Reducing those delays and streamlining the development process promotes jobs and the economy, and expedites the movement of people and goods by accelerating project completion.

5.3 The Old Colony Region

5.3.1 Roadway Network

The Old Colony region roadway network contains; limited access highways (Interstate 495, Route 24, Route 3, and Route 44) providing inter-state travel and inter-regional access; several major arterials (mostly state numbered routes) providing inter-regional and intra-regional travel; numerous collector roadways that provide access to the arterial and limited access highway network; and a sizable amount of local roadways which provide access to residences, businesses, and community centers. Figure 5-2 shows the percentage of different classifications of roadways within the Old Colony Region highway network.

Figure 5-2: Old Colony Region Roadway



The reliability of the highway network system within the Old Colony region is critical to ensuring economic vitality, access to education, as well as providing necessary emergency services. The physical layout of the roadway network in the Old Colony region creates challenges that communities must work with while encouraging future development. The lack of multi-modal accommodations encourages only automobile usage and as a result, the ability of the

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infrastructure to handle the demand is degraded. Figure 5-3 displays the Old Colony Region Roadway Network.

5.3.2 Intersections

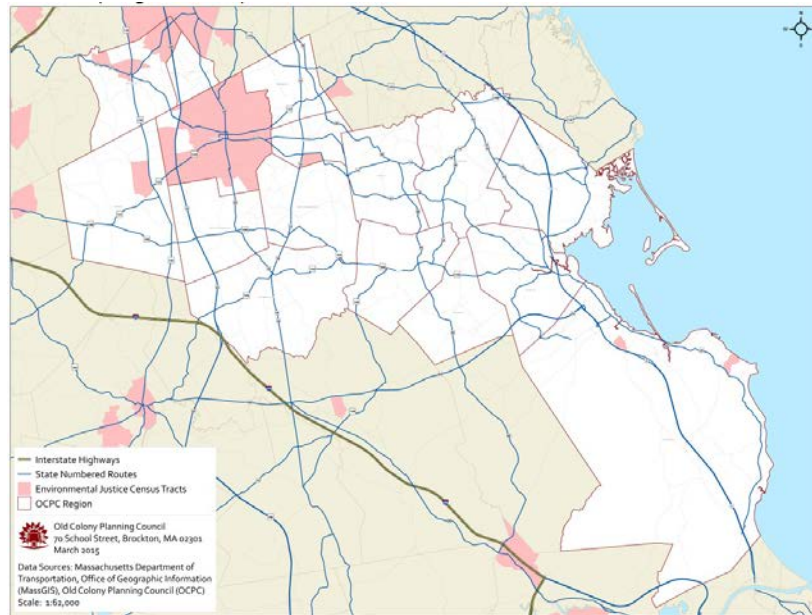
The Old Colony region contains nearly 9,000 intersections that provide a variety of functionality and movement. Ranging from major/high volume intersections (where arterials meet arterials) to minor/low volume intersections (where local roadways meet other local roadways) they all serve a specific purpose. A large number of the major/high volume intersections currently operate below satisfactory service levels and have elevated crash rates, while some of the minor/low volume intersections are overburdened with commuting traffic attempting to bypass higher volume locations. Generally, the safety issues are simply due to the number of vehicles converging on a single place; however, there are locations in the Old Colony region where geometric and traffic control improvements are necessary in order to provide a more efficient and safer system for all users.

Improvements such as traffic signals, supplemented with proper pavement markings, lane use and signage, assign right of way for road users, thereby contributing to the prevention of cross movement crashes, which tend to result often in personal injury or fatalities. Over the years, improvements in signal technology, including signal coordination and timing, have helped reduce delays and improve traffic flow at intersections, especially during peak periods.

5.3.3 Interchanges

Route 3 (Pilgrims Highway) and Route 24 (AmVets Memorial Highway) were both constructed in the 1940s and 1950s to serve the needs of that era; however, their designs are not sufficient to meet the safety and efficiency standards of today. Both limited access highways provide north-south connection from the south shore to metro Boston and have multiple interchanges in the Old Colony Region. Traffic on Route 3 and Route 24 has grown substantially since their openings due to high commercial and residential growth along the secondary arterials and collectors that provide access to these limited access highways. The connections that each highway provide result in higher traffic volumes, congested conditions, and safety issues at the interchanges within the Old Colony region as well as along these two key north-south arterials.

Figure 5-3: Old Colony Region Highway Network



Route 44 is a divided limited access highway in the Old Colony region (Plymouth, Kingston, and Plympton); however, it gradually transitions heading west from Route 3 into a two lane undivided major arterial in Middleboro. Route 44 is the only high volume, high speed arterial roadway that provides a direct east-west connection from Route 3 in the east to Route 24 in the west. The Route 44 interchanges in the Old Colony region were recently constructed (2005) and generally accommodate the traffic volumes sufficiently.

5.3.4 Downtowns

Many downtown areas within the Old Colony region have the traditional and historic characteristics found in many New England communities. These areas typically contain “non-conventional” intersections which create confusion for motorists and pedestrians. This is due mainly to the history of New England’s road system, which originated in the pre-automobile times. The communities we know now were settled in ways that weren’t centered on the needs of the automobile and therefore contain a great number of intersections that are not properly aligned for motor vehicle use. This pattern creates excessive congestion, potential safety issues, and is not typically inviting to bicycle and pedestrian usage.

Several downtown areas in the Old Colony region have experienced a decline in commercial activity as the majority of trips to the area are considered “pass-through” instead of “drive-to”. Downtown Bridgewater and Stoughton are examples of areas where the major state numbered routes converge in a central location of economic activity and government uses. Both communities are attempting to modify the traffic patterns and create a more bicycle and pedestrian friendly environment in order to revitalize their downtown area.

5.4 Traffic Volumes and Trends

Traffic volumes are an important component of transportation planning. Knowledge of current and historic traffic volumes allows planners and engineers to calculate the rate of traffic growth, expected vehicle emissions, and plan for traffic, pedestrian, and bicycle safety.

The Region, in general, has a north-south orientation with commuters traveling north to Boston and the Boston area during the morning commute and south back to the region during the afternoon commute; however, the current trends are that employment has become much more diverse with employment centers spread over a wider area, and commuters traveling farther distances between home and work. Corporations attracted by land availability and lower costs are locating office centers in suburban areas such as Stoughton, Avon, Norwell, Rockland, and Foxborough. This increase in the dispersal of employment opportunities has created an increase in suburb-to-suburb trips. Nevertheless, traffic volumes in the region are heaviest on the limited access highways and the state numbered routes, which provide the most direct connections between communities and provide connections to other principal arterials for inter-regional travel (see.

Specifically, over the past 5 years (2010-2014), traffic volumes on Route 24 in the Old Colony region increased approximately 2.6% while traffic volumes on Route 3 also increased by an average of 1%. Annual average daily traffic volumes on Route 3 and Route 24 in close proximity to Interstate 93 in Braintree and Randolph total over 120,000 vehicles per day and traffic backups are an everyday occurrence. The lack of east-west limited access highway connectivity results in higher traffic volumes on the east-west state numbered route system (i.e. Route 106 and Route 27), which results in longer delays at their major intersections. The afternoon commute traffic volumes on Route 106 are higher than what the facility is designed to handle and result in daily backups.

The changing land patterns in the Region and the redevelopment of industrial properties, which have been adapted for other mixed uses such as residential, commercial, and office, provide unique opportunities to reduce the length and number of auto trips and also to make better use of transit and inter-modal connections; however, it also creates a situation in which arterials and major collectors play an increasing role in regional travel and travel between communities. These arterials and collectors become destinations and serve a dual purpose. They provide inter-regional access and access to adjacent properties, which increases conflicts along the corridors, thereby reducing capacity.

5.5 Pavement Conditions

Over the past two decades, Old Colony has refined and updated its pavement management system (PMS) in keeping with the principles of objectives-driven, performance-based planning, and in fulfilling its goal of keeping the highway system in a state of good repair. A well-maintained system in good repair reduces delays (due to long reconstruction periods), enhances freight movement, improves economic vitality, and provides opportunities to implement Complete Streets strategies (improving the sidewalk and bicycle facilities network).

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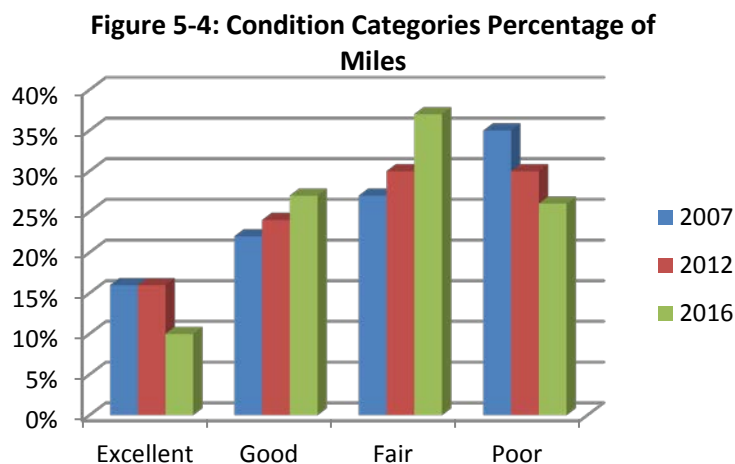
The PMS calculates the rate of deterioration of pavement and the implications for the cost of repairs. It calculates a Pavement Condition Index (PCI) score between 0 and 100 for the surveyed road segments and recommends a repair and cost based on the PCI score. Each road or road segment is placed in a condition category based on the PCI, which includes “Poor” (PCI = 0 to 64), “Fair” (PCI = 65 to 84), “Good” (PCI = 85 to 94), and “Excellent (PCI = 95 to 100).

Old Colony updates field inspections of the pavement surface every four years and supplements the data on an ongoing basis, as pavement reconstruction and resurfacing projects are completed on federal aid roads through the Old Colony Transportation Improvement Program (TIP). The repairs recommended by the PMS, based on the road condition, include five general default repair strategies.

These include:

1. Reconstruction – This work includes a combination of a number of tasks, including: complete removal and replacement of a failed pavement segment, road sub-base replacement (gravel, sand, and aggregates), drainage work, road realignment, and safety hardware (guard rail) installation.
2. Rehabilitation – The rehabilitation of pavements may include full and partial depth patching, joint and crack sealing, grouting and under-sealing, and grinding and milling in conjunction with overlays over two inches.
3. Preventative Maintenance – This work may include extensive crack sealing, chip sealing, and micro-surface or overlays less than two inches thick.
4. Routine Maintenance – This work may include crack sealing and pothole patching.
5. No Immediate Maintenance or Repair.

The total federal-aid road mileage in the region included in Old Colony’s PMS has increased to a total of 642 miles with the recent addition of Duxbury as an Old Colony member community. Figure 5-4 summarizes the percentage of the federal aid mileage in each of the condition categories for the 2016 Old Colony RTP and for previous RTPs in 2012 and 2007.



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Figure 5-4 shows that in the previous 2012 RTP, 16 percent of the federal aid roads were in the “Excellent” category, 24 percent in the “Good” category, 30 percent were in the “Fair” category, and 30 percent were in the “Poor” category. In the 2007 RTP, 16 percent of the federal aid roads were in the “Excellent” category, 22 percent were in the “Good” category, 27 percent were in the “Fair” category, 35 percent were in the “Poor” category. The condition survey results from the 2014 pavement data survey show that although there are less roads in the “Poor” category, more of the federal aid roads have slipped into the “Good” and “Fair” categories (27 percent and 37 percent compared to the previous 24 percent and 30 percent). Old Colony has set a goal to achieve 50% of federal-aid eligible roadways with PCI-based pavement ranking of "Excellent" or "Good" within 10 years. The total cost in improving all federal aid roads to a state of good repair is estimated by the PMS at \$213,891,765. The overall average PCI for all federal-aid roads is 77. The cost estimate for improving all federal aid roads to a state of good repair in the previous RTP was \$199,918,410 (the total mileage at that time was 590 miles, as Duxbury was not an Old Colony member).

5.6 Truck Freight

Trucking is the primary mode utilized for the movement of goods in the Old Colony region according to the nationwide freight study Freight Analysis Framework (FAF), which was developed for the U.S. Department of Transportation. The FAF estimates commodity flow and freight transportation activity among states, regions, and international gateways (including tonnage and value of goods) shipped by type of commodity and mode of transportation. The FAF estimates that shipments by truck will grow by 5 percent by the year 2035 in the Boston area (the Old Colony region is included in the Boston area in the FAF commodity flow model).

According to the FAF, freight moved by trucks is highest on the Massachusetts Interstate system, particularly on the I-84 and I-90 east west corridor into the Boston area, which is connected in the Old Colony region via I-495. According to the FAF, the Route 24 corridor carries the most highway freight in the Old Colony region (between 10 million to 30 million tons per year). The Route 3 Corridor (Plymouth, Kingston, Duxbury, and Pembroke) carries between 1 million and 10 million tons per year. The Route 106 corridor, between I-95 and Route 104 in the Towns of Easton and West Bridgewater, carries about 1 million to 10 million tons per year. According to the FAF, the tonnage on Route 106 between Route 24 and Route 104 is expected to grow to over 10 million by the year 2035.

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Figure 5-5: A tractor-trailer truck exiting Tosca Drive encroaches on the Central Street (Route 27) eastbound travel lane



Figure 5-6: Height limitations on Centre Street (Route 27), Brockton

There are challenges to trucking that include operational constraints as well as physical constraints within the region’s highway network that require updating and modernizing the highway system as well as maximizing operational capacity in highway corridors. The challenges impact the system’s reliability as well as the economic vitality of the region. These include re-occurring congested bottlenecks, poor intersection turning radii, height and weight restrictions, and lack of acceleration and deceleration lanes (lack of interstate standards on Route 24).

Key truck routes in Brockton Downtown, (including Elliot Street, Route 27 Court Street, Route 123 Centre Street, School Street, and Route 27 Crescent Street), pass under historic railroad stone arch bridges. The rail line in Brockton carries MBTA passenger rail as well as CSX freight. The height of these bridges at the center of the road varies. Some are 13 feet 6 inches at the center and 11 feet high at the edge of the road and some are as high as 15 feet 6 inches at the center of the road. The heights are insufficient for many of today’s heavy vehicles and some trucks must cross the double yellow center line to pass beneath them in order to clear the arches, which are at their highest in the center. In addition to the low railroad stone bridges, truck traffic turning between major east west routes in Brockton Downtown Brockton are hindered by tight turning radii. Trucks often encroach on other lanes or end up on sidewalks making these turns at intersections along Montello Street (Route 28) and Main Street in

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Downtown Brockton. Limited turning radii for trucks in the region is not limited to Brockton, as many of the region’s roads were constructed before tractor trailers were in widespread use.

5.7 Bridges

The Massachusetts Department of Transportation (MassDOT) compiles a database of inspected bridges (under state or local jurisdiction) designed to provide the means by which appropriate policies and programs can be considered. The database contains performance information (condition ratings) on bridges that span roadways, bodies of water, and railroad tracks, as well as a history of inspections and reconstruction. The bridge inspections conducted by MassDOT are consistent with federal standards and utilize the rating system developed by AASHTO using a scale 0 to 100 with 100 being the best. The goal of the MassDOT bridge inspections and Bridge Management System (BMS) is to predict failures and make improvements.

The MassDOT bridge database includes a structurally deficient or functionally obsolete determination for each bridge. Bridges are considered structurally deficient if significant load-carrying elements are found to be in poor or worse condition due to deterioration and/or damage, or the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing intolerable roadway traffic interruptions. According to the Federal Highway Administration (FHWA), if a bridge is determined to be unsafe based on the inspections, then the structure must be closed; however, the classification of a bridge as structurally deficient does not imply that it is likely to collapse or that it is unsafe. Deficient bridges that are open to traffic require significant maintenance and repair to remain in service. Structurally deficient bridges often have weight limits restricting the gross weight of vehicles using the bridges to remain in service (this is less than the maximum weight typically allowed by statute). Structurally deficient bridges require eventual rehabilitation or replacement to address deficiencies.

According to the 2014 MassDOT bridge database, there are six bridges in the Old Colony region identified as structurally deficient (see Table 5-1). Five of these structurally deficient bridges are in the design stage and are slated for replacement in the Old Colony TIP.

Table 5-1 – Old Colony Region Structurally Deficient Bridges

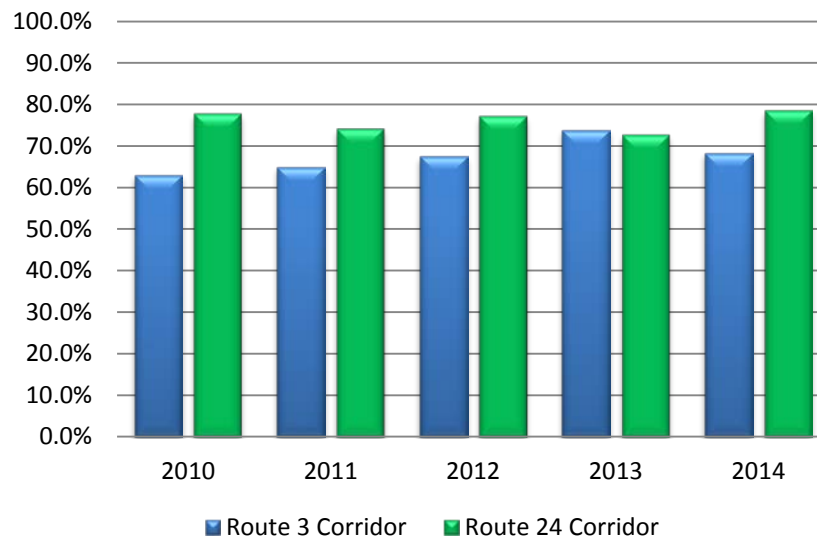
Community	Description	Owner	Road Class	Year Built	Rating	Project Status
Abington	Central Street over the Shumatuscacant River	Town	Urban Collector	1956	48.8	Design
Brockton	Route 24 over West Chestnut Street	State	Principal Arterial (Freeway)	1954	72.9	Design
Duxbury	Route 3 northbound over Franklin Street	State	Freeway/Expressway	1962	78.9	Design
Duxbury	Route 3 southbound over Franklin Street	State	Freeway/Expressway	1962	67.9	Design
Duxbury	Powder Point Avenue over Duxbury Bay	Town	Urban Local	1987	7	Temporary repairs by town 2013
Kingston	Route 3 over the Jones River	State	Principal Arterial (Freeway)	1955 (rebuilt 1978)	68.2	Design

Functionally obsolete bridges are older structures built with design standards that are different than current design standards. Additional factors used to determine a bridge as functionally obsolete are deck geometry, under clearance, and approach roadway alignment. Functionally obsolete bridges generally cannot accommodate the volume and nature of vehicle traffic due to insufficient vertical clearances and/or inadequate widths. According to the 2014 MassDOT bridge ratings, there were forty-one bridges (26 percent) in the Old Colony region classified as functionally obsolete.

5.8 Congestion and Bottlenecks

Congestion on a transportation facility may be defined as the level of performance that is deemed unacceptable due to traffic interference. Roadway or intersection congestion is often described in terms of capacity or more simply, the ability of a facility to process traffic during times of peak demand. Congestion occurs when the facility’s capacity is insufficient to meet the traffic demand.

Figure 5-7: Old Colony Region Park & Ride Facilities Utilization Rates



Bottlenecks are a condition that restricts the free movement of traffic creating a point of congestion during specific periods, usually the peak commuter periods. Bottlenecks have a number of different causes including operational influences (traffic signals and the physical design and alignment of intersections); the narrowing of a highway corridor and lane drops, weaving conditions, sun glare, steep grades, or crashes and incidents on a roadway.

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Figure 5-8: Traffic backed up heading toward East Bridgewater Center

The Old Colony region’s commuting patterns have traditionally had a strong orientation to and from the Boston area, which results in traffic heading in a general north south pattern. Based on current traffic monitoring, that north-south orientation is still prevalent; however, commuting patterns have gradually become more dispersed due to the diffusion of both residential growth and employment centers to areas west of Metro Boston. The Old Colony MPO is committed to reducing traffic congestion and eliminating bottlenecks by encouraging the use of travel alternatives such as carpooling, biking, and walking as well as by funding infrastructure projects that improve traffic flow and support a multi-modal environment. Figure 5-7 shows that although park and ride utilization rates have risen in the Old Colony region, more work needs to be done to encourage better usage.

The Old Colony MPO’s Congestion Management Process (CMP) identifies and monitors key facilities in the region that demonstrate congestion, create excessive delays, and exhibit circulation problems. Those key areas are typically limited access highway interchanges, major intersections, and downtown areas. Peak hour bottlenecks and heavy commuter traffic volumes occur on a daily basis on Route 3 (Pilgrim Highway) and Route 24 (AmVets Memorial Highway).

Specific locations where peak hour bottlenecks occur at Route 3 and Route 24 interchanges include, but are not limited to:

- Route 3 – Exit 3 (Clark Road) – Plymouth
- Route 3 – Exit 5 (Long Pond Road) – Plymouth
- Route 3 – Exit 6 (Samoset Street) – Plymouth
- Route 3 – Exit 9 (Route 3A) – Kingston
- Route 3 – Exit 10 (Route 3A & 53) – Kingston
- Route 3 – Exit 12 (Route 139) – Pembroke
- Route 24 – Exit 15 (Route 104) – Bridgewater
- Route 24 – Exit 16 (Route 106) – West Bridgewater
- Route 24 – Exit 17 (Route 123) – Brockton

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- Route 24 – Exit 18 (Route 27) – Brockton
- Route 24 – Exit 19 (Central Street/Harrison Boulevard) – Avon
- Route 24 – Exit 20 (Route 139) – Stoughton

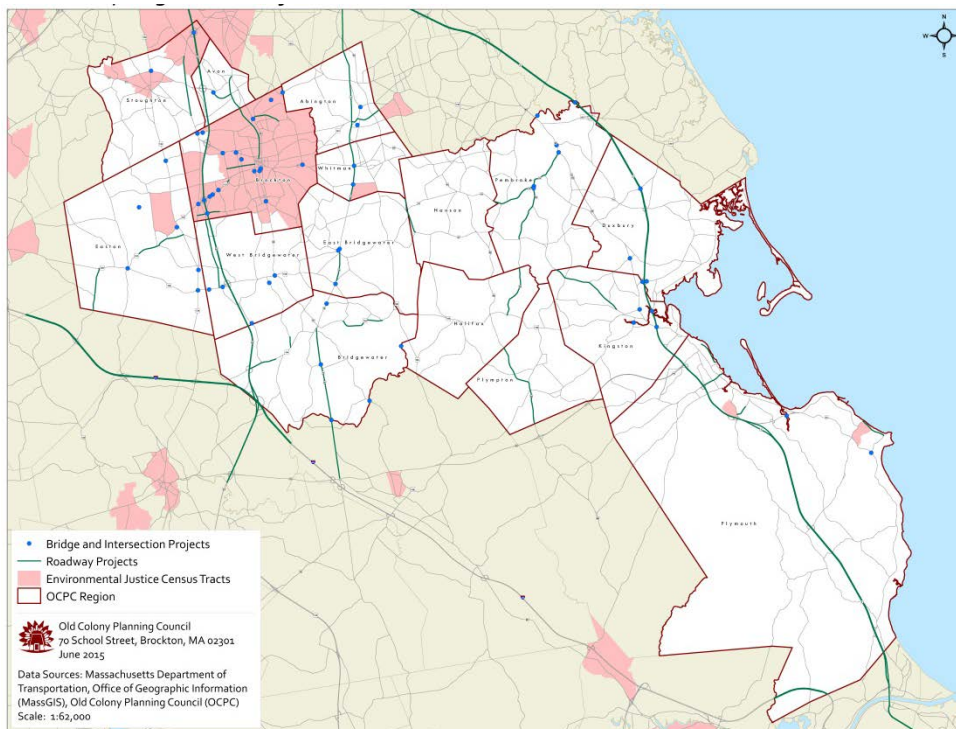
In addition, areas such as Downtown Brockton, Bridgewater Center, East Bridgewater Center, Downtown Plymouth, Stoughton Center, and West Bridgewater Center have daily congestion issues and re-occurring bottlenecks (See Figure 5-9).

Proper access management techniques, effective transportation demand management applications, proper traffic control, and providing a multi-modal environment are key elements needed to reduce congestion and the occurrence of bottlenecks.

5.9 Improving the System for all Users

According to the U.S. Environmental Protection Agency (EPA), Environmental Justice is defined as: “The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.”

Figure 5-9: Transportation Improvement Projects in the Region



Equity in the distribution of transportation resources and services for low income and minority communities and neighborhoods is a central component to the planning work done in the Old

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Colony Region. The Old Colony Metropolitan Planning Organizations (MPO) provides full and fair participation for all socio-economic groups throughout the planning and decision-making processes, and as a result of those processes, all people and groups within the MPO realize the benefits of transportation projects and bear equally any adverse impacts from them as well.

The Old Colony MPO supports projects that will facilitate access to population and employment centers, improve safety at specific intersections and on specific highways, improve air quality, and enhance the quality of life in its member communities. Such projects include enhancing capacity and resurfacing roads, improving safety and traffic flow at intersections, enhancing bicycle facilities, constructing and enhancing inter-modal facilities, improving sidewalks and connectivity, and encouraging the Safe Routes to School (SRTS) participation among the region’s schools. Figure 5-9 shows the distribution of past and proposed projects throughout the region which serve a variety of neighborhoods and communities.

5.10 Conclusion and Recommendations


The Old Colony region’s transportation system is an essential asset that contributes greatly to the economic well-being of the region as well as to the quality of life for the region’s residents. The system continues to improve but more is needed in order to provide a safe and reliable future network. As such, the Old Colony MPO has identified the following issues facing the region.

5.10.1 Congestion Management Recommendations

The Old Colony region has numerous areas that demonstrate congestion, create excessive delays, and exhibit circulation problems.

Numerous limited access highway interchanges, town centers, and densely developed highway corridors in the Old Colony region suffer from daily congestion and have serious circulation issues due to the lack of proper access management, effective transportation demand management applications, proper traffic control, and a lack of multi-modal accommodations.

Objective: Reduce traffic congestion, and improve level of service and access management


 **Target and Performance Measure:** Monitor congestion levels on federal-aid eligible highway network annually, and highlight corridors with volume to capacity (v/c) ratios of 0.8 or greater for targeted study and/or improvements

Objective: Increase use of traffic signal priority (hold current green light) for transit vehicles and traffic signal pre-emption for emergency vehicles (override programmed phasing to provide approaching emergency vehicles a green light)

Carpooling rates in the Old Colony region continue to be low.

Residents in the Old Colony region continue to rely on the automobile as their primary way of getting from place to place. Commuter Rail transit service and state owned park and ride facilities are provided in the region; however, their utilization is still low compared to other parts of the Commonwealth.

Objective: Monitor utilization and congestion levels at commuter rail and Park and Ride parking facilities

 **Target and Performance Measure:** Record utilization data twice annually and report data to MassDOT

Encourage the use of Access Management techniques

Access Management is defined as the planning of the design, location, and operation of driveways, median openings, interchanges, and street connections. Access management provides two important advantages when applied to a roadway corridor: 1.) It minimizes conflicting turning movements in a highway corridor, thereby reducing interruptions in the traffic flow and conserving highway corridor capacity, 2.) The reduction in conflicting turning movements decreases motorists exposure to crashes, thereby increasing safety.

Incorporate Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) are applications of advanced technology in the field of transportation, with the goals of increasing operation efficiency and capacity, improving safety, reducing environmental costs, and enhancing personal mobility. Successful ITS deployment requires an approach to planning, implementation, and operations that emphasizes collaboration between relevant entities and compatibility of individual systems.

Continue to support the Traffic Monitoring System for Highways. Support actively maintaining and participating in coordinated Traffic Monitoring System for Highways.


Large employers should be encouraged to form Transportation Management Associations (TMAs), which marshal business resources to manage employee transportation needs on an area-wide basis. MassRIDES for example, is available to provide TMA assistance that match employees who wish to carpool, vanpool, etc. Demand for costly long-term parking can be managed by encouraging shared-ride commuting through preferential parking incentives or special discounts for employees.

5.10.2 Freight Movement Recommendations

Freight movement on the regional highway network is impacted by recurring bottlenecks and by physical constraints.


Trucking is the primary mode utilized for the movement of goods in the Old Colony region and there are a number of challenges that include operational constraints as well as physical constraints within the region’s highway network. Recurring bottlenecks, poor intersection turning radii, height and weight restrictions, and lack of limited access highway acceleration and deceleration lanes must be prioritized in order to maintain productive freight movement and highway network travel time reliability in the Old Colony region.

Objective: Reduce delay along identified freight routes

 **Target and Performance Measure:** Address minimum of (2) freight corridors through UPWP every four years

Objective: Increase viaduct clearance to improve freight movement, emergency response, and reduce delay

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 **Target and Performance Measure:** 100% of underpasses on freight corridors have highway standard vertical clearance by 2040

Objective: Improve safety along freight routes

Conduct studies concerning the movement of goods/materials within and through the region including the movement of hazardous materials, the identification and designation of regional and local truck routes, the identification of additional inter-modal facilities, and the overall enhancement of the efficient movement of freight.

5.10.3 Highway Design and Capacity Recommendations

The sub-standard design of the limited access highways and interchanges in the Old Colony region limit the ability of the infrastructure to handle the current traffic demand.

Peak hour bottlenecks and heavy commuter traffic volumes occur on a daily basis on Route 3 (Pilgrim Highway) and Route 24 (AmVets Memorial Highway) due to their sub-standard design. Specifically, motorists are allowed to use the breakdown lane on Route 3 during the morning and afternoon peak periods in order to provide additional capacity and the majority of the interchange ramps, deceleration ramps, and acceleration ramps are undersized.

Objective: Eliminate bottlenecks on limited access highways and on the freight network

Objective: Provide and maintain highway network travel time reliability

Improve capacity within the Old Colony region

Improving capacity alone will not solve the congestion problems in the Old Colony region; however, there are certain areas where capacity enhancements are needed in order to provide a more efficient and safer network. Areas in the Old Colony region where capacity enhancements are recommended include, but are not limited to:

- Route 3 (Route 18 to Long Pond Road)
Route 3 provides two lanes in each direction between Route 18 in Weymouth and the Sagamore Flyover. Traffic backups are common heading north during the morning commute and heading south during the afternoon commute due to traffic entering the highway and a lane drop respectively. Vehicles are allowed to travel in the breakdown lane during both commuting periods which provides for additional capacity; however, it also creates conflict points for normal access and egress.
- Route 3 – Exit 5 (Long Pond Road)
The Long Pond Road interchange currently cannot handle the vehicular demand and routine traffic backups exist. The Route 3 southbound off-ramp routinely backs up onto the highway creating hazardous travel conditions and the Route 3 northbound on-ramp does not provide adequate acceleration space for vehicles entering the travel stream. A redesigned interchange is needed at this location.
- Route 24 – Exit 18 (Route 27)
Traffic demand generated by the Westgate Mall area interfares with traffic at the Route 24 Exit 18 interchange. Queued traffic from the intersection of Reynolds Highway (Route 27) at Westgate Drive and Christy’s Drive, located just east of the interchange, extends

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into the interchange creating congestion and safety hazards. A redesigned interchange with improved coordination with Westgate Mall driveway intersections is needed at this location.

- Route 24 – Exit 15 (Route 104)
The recent signalization of the Route 104 interchange on/off ramps provided relief for vehicles attempting to travel north on Route 24; however, the current demand for that movement creates backups that at times interfere with the adjacent traffic signal. A slip ramp from Route 104 to Route 24 is needed at this location.
- Route 106 Corridor
A surge in development along the Route 106 corridor in West Bridgewater has created numerous curb cuts which added to the atiquated traffic signals creates a daily bottleneck from Route 24 to Route 28. Capacity enhancements with proper multi-modal accommodations are needed for this location.


Roundabouts, as well as traffic calming techniques, should be included in the analysis of improvement alternatives in studies that focus on the development of solutions to safety and traffic congestion.

5.10.4 Pavement and Bridge Recommendations

There are more roads in the Old Colony region with a “fair” or “poor” pavement condition rating than those with a “good” or “excellent” rating.

Currently, the “Fair” and “Poor” categories total 63 percent of the total amount of federal aid roads while the “Good” and “Excellent” categories total 37 percent. A pavement system in disrepair increases delays, restricts freight movement, and inhibits economic vitality.


Objective: Improve pavement conditions and state of good repair

-  **Target and Performance Measure:** Achieve 50% of federal-aid eligible roadways in the region with a PCI-based pavement ranking of “Good” or “Excellent” within 10 years

There are several bridges in the Old Colony region that have been identified as structurally deficient.

According to the MassDOT bridge database, there are six bridges in the Old Colony region identified as structurally deficient. Bridges play a vital role in the highway network providing links over natural obstacles such as rivers and streams and enhancing the efficiency of the network.

Objective: Improve bridge conditions

-  **Target and Performance Measure:** Maintain percentage of bridges categorized “structurally deficient” below 5% and increase overall average AASHTO rating (current 79) by 10 percent by 2040

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Continue to monitor and evaluating pavement distresses along the federal aid eligible roadways and development maintenance and budgetary strategies, which increased efficiency in terms of the utilization of federal and state money.

Continue to support bridge management and the Bridge Management System.

Continue the focus on maintenance of local bridges and support increased emphasis on the rehabilitation needs of locally maintained bridges, especially those falling in the Structurally Deficient and Functionally Obsolete categories.

Pavement Management Systems should address municipal program requirements. Pavement management should include provisions for policies that address the growing maintenance queues experienced by municipal highway officials who must maintain increasingly deteriorating local roadway with fewer fiscal resources.

5.10.5 Transportation Planning and Policy Recommendations

The Old Colony regional highway network contains areas vulnerable to the effects of climate change.


The roads and bridges in the Old Colony region are considered some of the oldest in the country and when combined with severe weather events, this infrastructure is susceptible to major damage. The most immediate impact of more intense precipitation is the increased flooding of bridges and roads, especially those near the coastline and those located within 100 and 500 Year Flood Zones. Although the impact of sea level rise is limited to coastal areas, the effect of intense precipitation on land transportation infrastructure and operations is more widespread.

Objective: Protect and strengthen transportation systems vulnerable to climate change through identification of at-risk transportation assets and development of protection measures for each category of asset.


The cost of transportation improvement projects continue to rise.

Delays in the project development and delivery process can increase project costs. Reducing those delays and streamlining the development process promotes jobs and the economy, and expedites the movement of people and goods by accelerating project completion.

Objective: Continue to utilize transportation evaluation criteria in screening potential TIP projects

 **Target and Performance Measure:** 100% of all potential projects undergo initial evaluation to determine if project is realistic, viable, and implementable



Objective: Enhanced screening and evaluation of projects to determining Year 1 readiness for TIP

 **Target and Performance Measure:** 100% of potential Year 1 TIP projects are screened for implementation readiness

 **Target and Performance Measure:** At least 80% of Year 1 TIP Projects are advertised

Objective: Continue to maintain annual participation at TIP Day with MassDOT

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-  **Target and Performance Measure:** 100% attendance and participation at TIP Day
-  **Target and Performance Measure:** At 25% design stage, work with stakeholders on 100% of potential projects to determine ROW, environmental permitting, and other potential challenges to project development and implementation

Reduce delays in the project development and delivery process.

Continue the support of management systems (congestion, pavement, land use, and safety).

Implement access management and design guidelines at the local level through a number of avenues (Master Plans, Zoning Ordinances, and Subdivision regulations and site plan reviews) to conserve capacity in highway corridors, improve traffic flow and safety, decrease auto dependency, include mixed use development (thereby decreasing sprawl), and improve the quality of development in highway corridors.

Mitigate congestion along corridors and develop strategies that address the root cause of bottlenecks. Support the mitigation of corridor segments currently experiencing congestion problems.

Promulgate policy to address needs for improving physical constraints for freight movement including raising bridge clearances to accommodate double stacking of containers in railroad freight hauling operations to promote intermodal opportunities. Freight needs include improving truck turning radii and height and weight restrictions for truck freight movement.

5.10.6 Infrastructure Assessment and Needs Recommendations

The Old Colony region's transportation system is an essential asset that contributes greatly to the economic well-being of the region as well as to the quality of life for the region's residents. Updating and modernizing the system and conserving and enhancing existing highway capacity by utilizing resources in the most efficient and effective manner as possible requires a comprehensive approach in identifying specific improvement projects and strategies. The following recommendations address the regions' needs based on the planning process and continued cooperation on a regional basis including member communities, transportation agencies, and state agencies:

Collaboratively Develop the Needs of the Old Colony Region

In order to develop a comprehensive needs assessment for the region, all stakeholders must have an active role in the discussion. Project need and the scope of a project are developed through the 3C's Process, (Continuing, Comprehensive, and Cooperative), led by the Old Colony Joint Transportation Committee, with oversight from the Old Colony Metropolitan Planning Organization (MPO).

Old Colony's strategies and projects, as well as its transportation review (MEPA) process, support and advance MassDOT policies and goals as outlined in its statutes, directives,

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guidelines, and standards. It is the intent of this plan to see that projects are developed and implemented in an equitable and timely manner based upon need, financial constraint, and in conformance with the MassDOT design standards, practices, and directives, as well as with local master plans, comprehensive plans, and consensus based on Old Colony’s public outreach program.

The Universe of Projects outlined in the Appendix was developed as a result of the planning process based on the continued cooperation between Old Colony, the general public, member communities, transportation agencies, and state agencies. At its core, it represents the collaborative effort to develop the needs of the Old Colony region. The potential projects identified in the Universe of Projects have been identified through planning efforts executed under Old Colony Metropolitan Planning Organization such as the corridor studies, regional traffic studies, bicycle and pedestrian planning activities, and projects completed under the Local Highway Planning Technical Assistance (LTA) program. These potential projects have been identified through consultation with officials from the communities.

The following tables list projects derived from the Universe of Projects that are recommended for implementation in the next ten years. Selection of these projects was based on the FFY 2016-2019 Old Colony Transportation Improvement Program, current design statuses, and demonstrated community support. Additionally, these desired results of these projects will help the Region achieve its goals, objectives, and performance targets.

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Table 5-2: Recommended Projects FFY 2016-2020

FFY	PROJECT ID#	PROJECT DESCRIPTION	Cost Estimate
2016	608085	AVON - INSTALLATION OF A MEDIAN BARRIER ON HARRISON BOULEVARD	\$460,000
2016	606036	BROCKTON - SIGNAL & INTERSECTION IMPROVEMENTS @ ROUTE 123 (BELMONT STREET)/LINWOOD STREET/LORRAINE AVENUE	\$3,541,396
2016	604957	PEMBROKE - RECONSTRUCTION ON ROUTE 14, FROM THE HANSON T.L. TO ROUTE 53 AC PHASE 2 OF 2	\$2,085,520
2017	607438	EASTON - ROUTE 138 @ UNION STREET SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,044,228
2017	607337	PEMBROKE - ROUTE 53 AT PLEASANT STREET SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,957,841
2017	605038	PLYMOUTH- RECONSTRUCTION OF TAYLOR AVENUE, FROM WHITE HORSE ROAD TO MANOMET POINT ROAD, INCLUDES P-13-010	\$5,310,240
2018	606264	PLYMOUTH - IMPROVEMENTS ON OBERY STREET, FROM SOUTH STREET TO A.A. CARANCI WAY/PLYMOUTH NORTH H.S. DRIVE INTERSECTION	\$4,995,087
2018	606143	BROCKTON- INTERSECTION IMPROVEMENTS @ CRESCENT STREET (ROUTE 27)/QUINCY STREET/MASSASOIT BOULEVARD	\$3,897,438
2019	608143	BROCKTON - NORTH QUINCY STREET, CHESTNUT STREET, AND BOUNDARY AVENUE SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$2,240,448
2019	607217	EASTON - ROUTE 123 (DEPOT STREET) RECONSTRUCTION ON FROM NEWELL CIRCLE TO ROUTE 138	\$7,220,326
2020	607403	STOUGHTON - INTERSECTION IMPROVEMENTS & RELATED WORK AT WASHINGTON STREET (ROUTE 138) & CENTRAL STREET	\$3,494,400
2020	PRE - PRC	PLYMOUTH - WATER STREET RECONSTRUCTION (SOUTH PARK AVENUE TO ROUTE 3A)	\$6,988,800
TOTAL PROGRAMMED (ESTIMATED):			\$43,235,724
TOTAL REGIONAL FUNDING TARGET:			\$46,865,961

Table 5-3: Recommended Projects FFY 2021-2025

FFY	PROJECT ID#	PROJECT DESCRIPTION	COST ESTIMATE
2021-2025	605693	ABINGTON SAFE ROUTES TO SCHOOL (CENTER SCHOOL)	\$570,286
2021-2025	PRE - PRC	BROCKTON - DOWNTOWN BROCKTON CIRCULATION	\$9,963,183
2021-2025	PRE - PRC	EASTON - ROUTE 138 & ELM STREET INTERSECTION SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,315,932
2021-2025	600380	PEMBROKE - REHABILITATION OF ROUTE 36 FROM ROUTE 27 TO ROUTE 14	\$4,748,004
2021-2025	606002	DUXBURY - SIGNAL INSTALLATION @ ROUTE 3 (NB & SB) RAMPS & ROUTE 3A (TREMONT STREET)	\$3,158,236
2021-2025	PRE - PRC	STOUGHTON - CENTRAL STREET & CANTON STREET (ROUTE 27) SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,315,932
2021-2025	PRE - PRC	STOUGHTON - CANTON STREET (ROUTE 27) & SCHOOL STREET SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,315,932
2021-2025	PRE - PRC	BROCKTON - ROUTE 27 - CRESCENT STREET, LYMAN STREET, AND SUMMER STREET INTERSECTION IMPROVEMENTS	\$4,342,575
2021-2025	PRE - PRC	ABINGTON - SIGNAL INSTALLATION AND IMPROVEMENTS @ HANCOCK STREET AND CHESTNUT STREET	\$2,001,290
2021-2025	PRE - PRC	EAST BRIDGEWATER - INTERSECTION IMPROVEMENTS @ BEDFORD STREET (ROUTE 18) AT EAST STREET AND WEST STREET (ROUTE 106)	\$2,001,290
2021-2025	604098	EASTON - ROUTE 138 & TURNPIKE STREET INTERSECTION SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$2,001,290
2021-2025	607214	STOUGHTON - RECONSTRUCTION OF TURNPIKE STREET	\$19,212,787
TOTAL PROGRAMMED (ESTIMATED):			\$30,162,374
TOTAL REGIONAL FUNDING TARGET (FORECAST):			\$49,330,022

5.10.7 Livability and Mobility Recommendations

Coordinate Transportation and Land Use

The commercial and retail centers that have proliferated along important arterials and collectors are generally auto dependent, mainly single-use zoned, extensive (spread out over large areas), and not conducive or safe for bicycle or pedestrian travel. This “sprawl” development along the highway corridors has resulted in impacts that include high vehicle emissions, more traffic congestion, high per-person infrastructure costs, less space for conservation and parks, and inefficient street access. In addition, a lack of control, placement

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and spacing, and width of curb cuts that provide access to adjacent properties has become prevalent throughout most of the arterial corridors within the Old Colony region.

Coordinating transportation and land use prevents highways from becoming unattractive, dysfunctional commercial strips. Highway corridor plans should be coordinated with local master plans and comprehensive plans that support strategies that emphasize density, a diversity of land uses, a variety of mode choice (transit, bicycle, walking), and design standards.

The integration of transportation and land use planning includes:

- Encouraging the redevelopment of traditional town centers by utilizing mixed-use zoning and creating streets that are safe and compatible with pedestrian and bicycle use
- Encouraging development design in corridors that strengthens the physical character of the community and supports the value of properties and the quality of developments
- Setting basic requirements for site design for, building design, landscaping, and signage
- Permitting safe and convenient access and on-site circulation for motorized vehicles, non-motorized vehicles, and pedestrians
- Managing the impacts of commercial and industrial development on adjacent residential neighborhoods
- Improving access management; planning the design, location, and operation of driveways, median openings, interchanges, and street connections

Create a Multi-Modal Transportation System

Supporting MassDOT’s GreenDOT policy by encouraging communities in the Old Colony region to incorporate bicyclists, pedestrians, and transit users in their future plans and/or future designs is a key component in creating a region wide multi-modal system. In addition, encouraging communities to support MassDOT’s Mode Shift goal by improving their inter-modal connections around transit stations and park and ride facilities and supporting land uses that enable walking, bicycling, and transit use (denser development, Complete Streets policies, and Transit Oriented Development, TOD) will foster a more sustainable region.

Implement Complete Streets policies in all projects in order to accommodate pedestrians and bicycles in all bridge maintenance and construction.

The addition of sidewalks and bike lanes or shared byways where appropriate, should be a considered whenever bridges are replaced or rehabilitated.

Conduct studies to improve east-west access in the region, including the further study of the widening of Route 106 from Route 24 to just east of Route 28 in West Bridgewater.

Encourage the provision of adequate parking and traffic mitigation at the Old Colony Rail Line facilities.

It is imperative that local officials confer with MBTA planners and engineers to determine that access and egress to/from station sites are properly mitigated.

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Enhance vehicle circulation in the traditional downtowns of member communities and advocate improvement strategies and plans for enhancing pedestrian and bicycle downtown access and circulation.

5.10.8 Highway Safety Recommendations

Improve safety and traffic flow at intersections. Support the initiation and continuation of the road safety audit as a means to improve safety and traffic flow.

Support installation of ‘rumble strips’ on all divided highways in the region.

Bridges or underpasses should be a consideration at the grade crossings of the commuter rail system planned for construction.

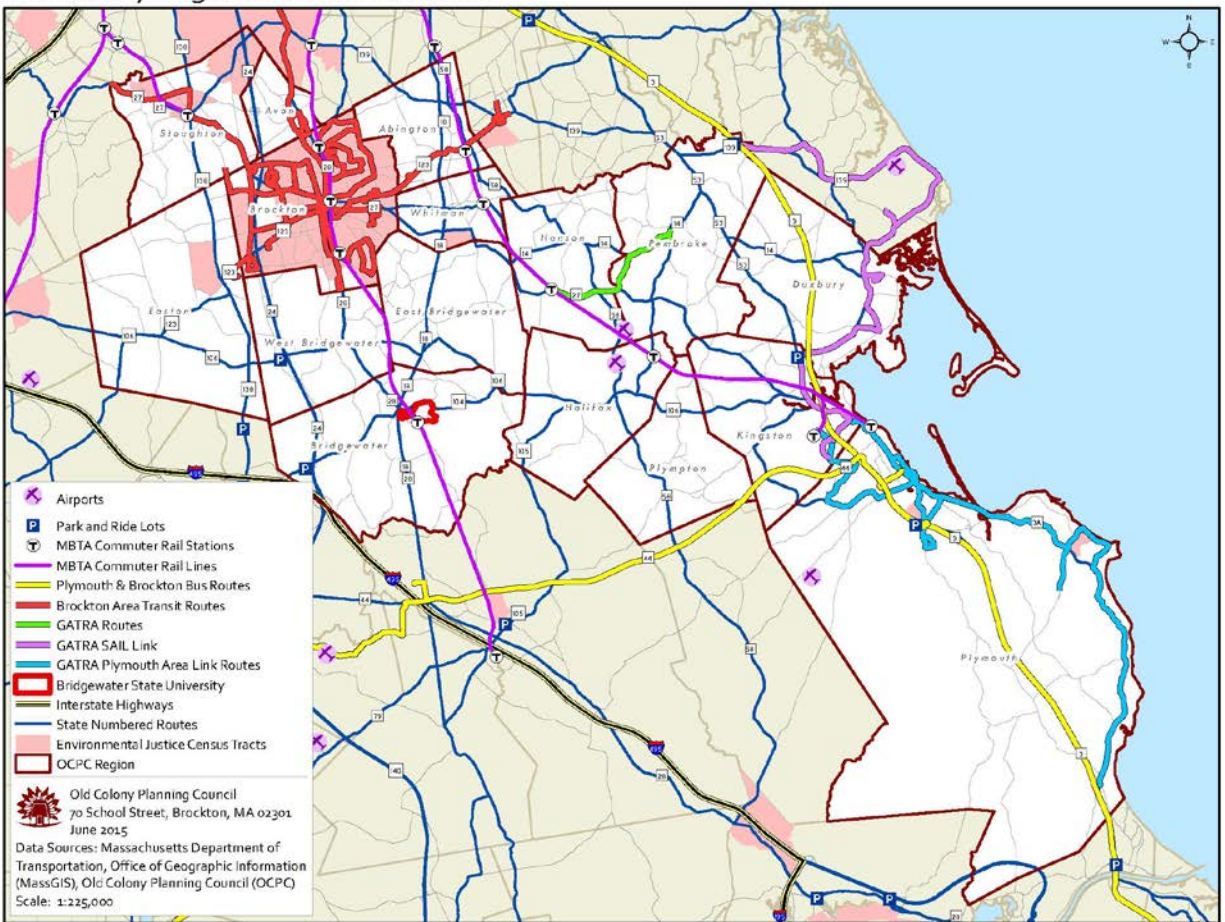
6 TRANSIT

While the Old Colony region is fortunate to have many transportation options, most of these options are underutilized due to an over reliance on automobile transportation or the lack of knowledge of these other transportation choices. As a result of this lack of greater use and knowledge of these other modes of transportation in the region, traffic congestion continues to increase in certain areas, climate changing greenhouse gases remain an issue, pedestrian and cyclist injuries persist and climb in some municipalities, economic transactions that might have taken place do not, and smaller airport facilities go underutilized. It is the goal of the region to reduce these negative effects by making all modes of transportation attractive to use.

In this chapter we will review the current transportation network as it exists today. We will identify needs within in the transportation networks. Then will put forth suggestions on how those gaps can be filled to meet the future transportation needs of the Old Colony Region.

Figure 6-1: Passenger Transit Network

Old Colony Regional Transit Network



6.1 Issues Challenging the Regional Transit Network

A significant portion of the Region has limited transit options. While the region is fortunate to have three RTAs operating within it, there are still communities that do not receive service and there exist barriers to traveling within, to, and out of the Old Colony Region. Similarly, there are communities and populations underserved by demand response (paratransit) and human services transportation. Populations that utilize this service are growing and the agencies that provide the transportation are struggling to keep up.

Transit has a reputation among the general public as being slow and inefficient. For some, bus service is characterized as slow and inefficient. This perception of the fixed route bus service causes it to be an overlooked mode of transportation. It is the goal of the Commonwealth, as laid out by MassDOT in 2012, to triple the share of travel by other modes of transportation, which includes public bus service. In order to help achieve these goals, the Old Colony Region through close coordination with BAT, GATRA, and the Old Colony MPO, will continue to analyze options to make the bus system more efficient.

Gaps exist in transit service, particularly between different Regional Transit Authorities. Through previous studies to identify gaps in the fixed route bus system in the Old Colony Region, it was determined that bus service linking both GATRA and BAT should be studied to see where these links should be made. Two such missing links were recently determined via the BAT's Comprehensive Regional Transportation Plan study being developed by Old Colony Planning Council staff. One frequently requested link was between the City of Brockton and the Town of Taunton. Another missing link was between Brockton and the GATRA service area in Plymouth. Additional studies to determine corridors conducive to linking these two regions and RTA's should be completed.

Transit service needs reliable, sustainable funding sources. Having sustained sources of public transit funding is key to keeping the Old Colony Region's public transit system in a state of good repair, making it a reliable form of transportation for the public and enabling it to meet the transportation needs of the region. Filling the funding gaps should be a multipronged approach via increased Federal and Commonwealth funding, and through better fare box return.

The cultural and socioeconomic diversity of the region presents potential barriers to transit access. In addition to increasing on-time performance and making the fixed route bus systems in the region more dependable to spur greater usage, it is key that the MPO and transit authorities provide all their public documents in different languages and accessible formats for those that have limited English skills or seeing and hearing challenges. Providing translation and accessible formats of documents like bus schedule, public meeting notices, and agency reports will help gain the trust of limited English speakers and those with hearing and seeing challenges and encourage them to use the fixed route bus system.

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Automobile and bicycle parking is underperforming at Commuter Rail and Park-and-Ride commuter lots. Data from the Old Colony Congestion Management System indicates parking lot utilization remains low at several of the Region’s commuter rail and Park-and-Ride lots, by both motorists and bicyclists. Furthermore, bicycle parking infrastructure is inconsistent from station to station. The Old Colony MPO is committed to achieving mode shift goals by working with agencies to maximize the potential of these facilities.

6.2 Existing Public Transportation Network

The Old Colony region is fortunate to have three Regional Transit Authorities (RTA) operating within it; the Brockton Area Transit Authority (BAT) servicing the city of Brockton and adjacent communities, the Greater Attleboro Taunton Regional Transit Authority (GATRA) that provides service to the towns of Duxbury, Hanson, Kingston, Pembroke, and Plymouth; and the Massachusetts Bay Transportation Authority (MBTA) that provides bus and commuter rail service in the region. Even though the region is fortunate to have two of the Commonwealths RTAs operating primarily within it, ridership on the BAT and GATRA systems continues to be dominated by those who are transit dependent leading to an underutilization of the RTAs. This underutilization of the RTAs leads to greater traffic congestions on local roads and highways and contributes to the under performance of the Commonwealth’s goal of increasing mode shift away from private automobile travel.

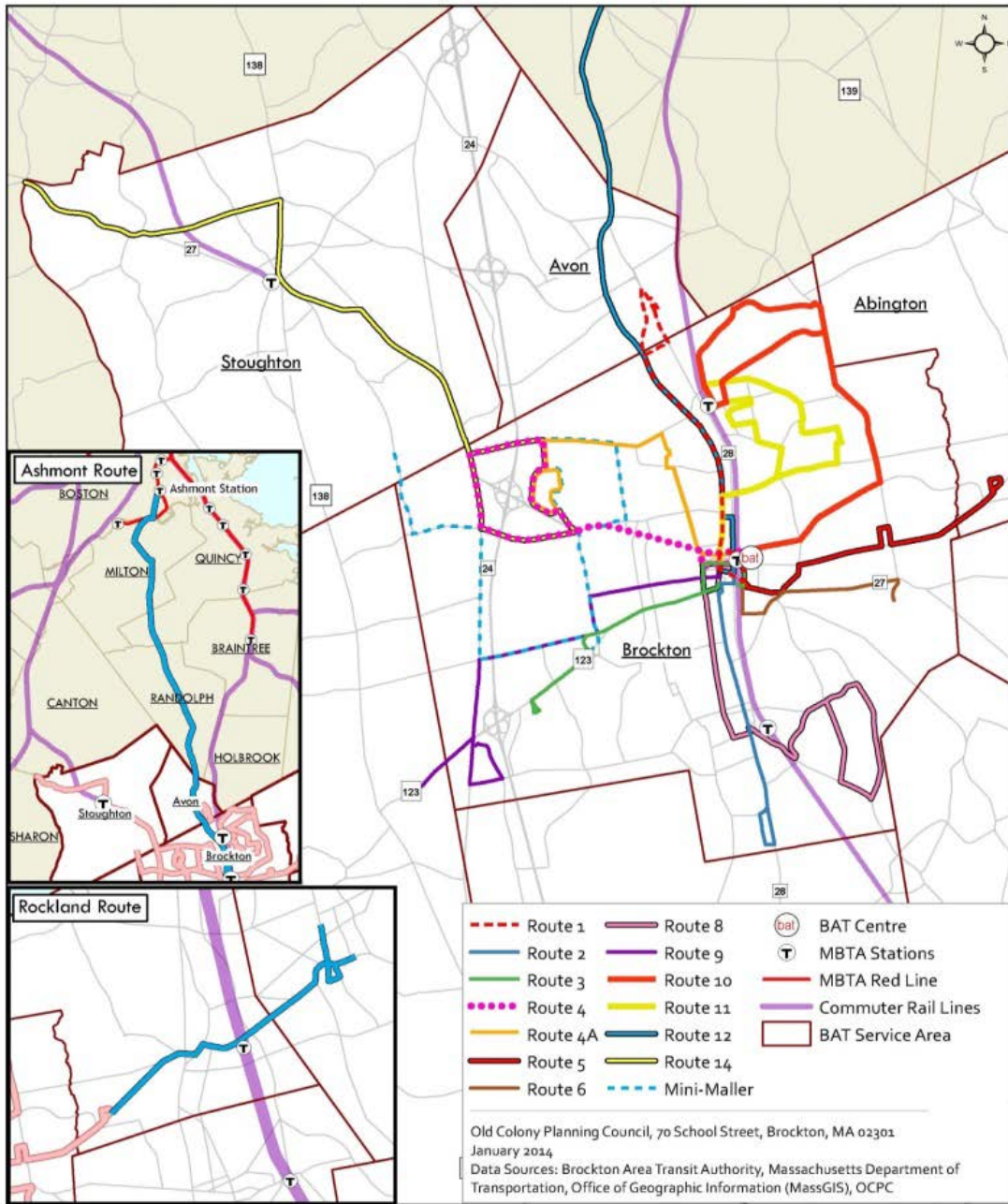
6.2.1 Fixed Route Bus Service

Brockton Area Transit Authority (BAT)

The Brockton Area Transit Authority (BAT) is the largest Regional Transit Authority (RTA) operating primarily in the Old Colony Region with an average yearly ridership just over 2.8 million boardings and just over \$4.1 million in annual fare revenue in FY2014. BAT operates 16 fixed bus routes primarily within the City of Brockton with lines branching out to neighboring communities as seen in Figure 6-2 and to the City of Boston along with paratransit/demand response service operating in 15 communities. Along with operating fixed route and paratransit/demand response service, BAT also provides buses to Bridgewater State University, providing transportation to its student body. In addition to serving the city of Brockton, neighboring communities and the paratransit/demand response community, BAT provides service to three MBTA Commuter Rail facilities and the Ashmont MBTA Red Line Station providing multimodal links between the Old Colony Region to the City of Boston and communities outside the region.

Figure 6-2: Brockton Area Transit Authority System

Brockton Area Transit Authority Fixed Route System



The greater Attleboro Taunton Regional Transit Authority (GATRA)

The Greater Attleboro Taunton Regional Transit Authority (GATRA) is a transit authority operating in 28 communities, including Duxbury, Hanson, Kingston, Pembroke, and Plymouth in the Old Colony region. The system has a system combined ridership of about 221,464 boardings a year and just over \$31 million in operational revenue. GATRA lines serving the Old Colony region include the Plymouth Area (PAL), the Sea Area Inter-Link (SAIL), and the Pembroke Shuttle. The PAL system consists of four routes primarily servicing the town of Plymouth and

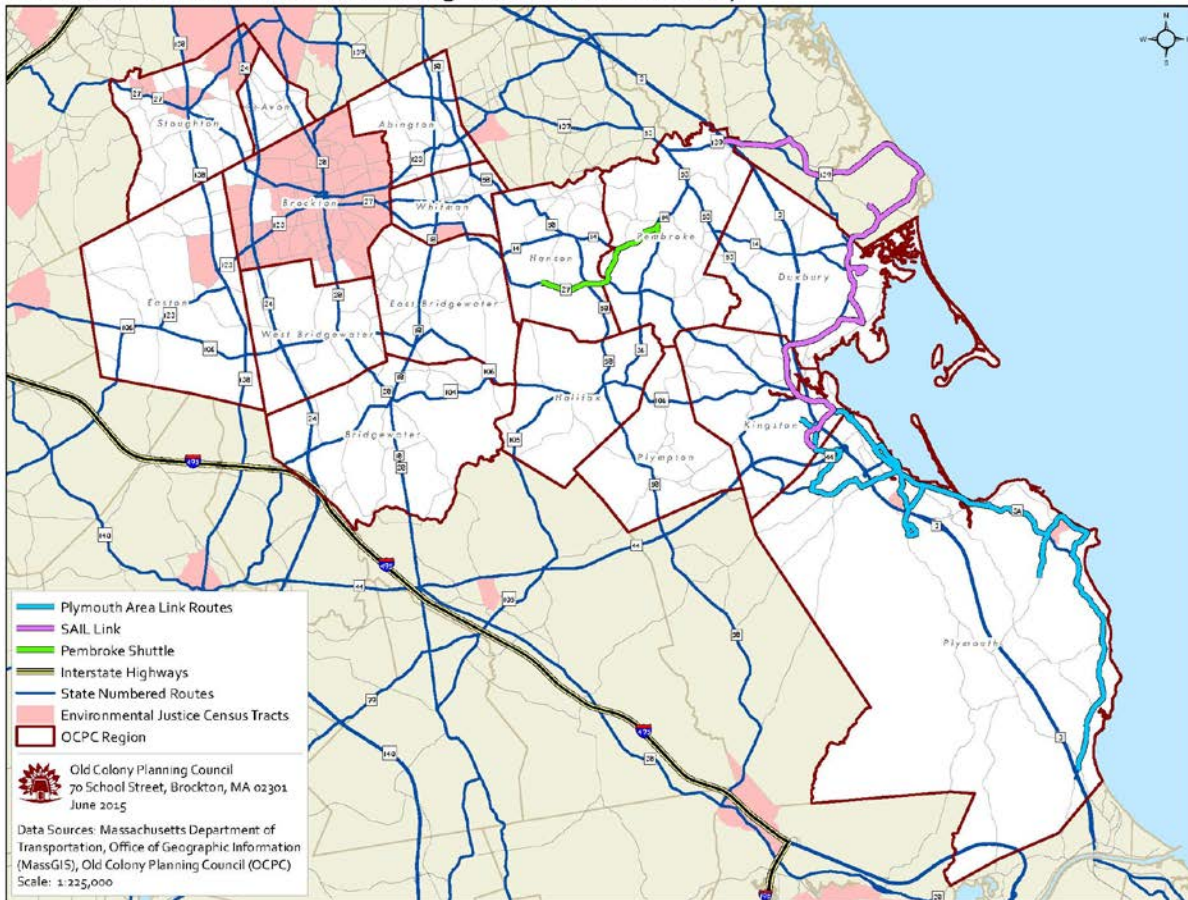
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one line servicing the town of Kingston. The SAIL operates within the towns of Marshfield, Duxbury, and Kingston. In addition to the PAL and SAIL systems is the service between Pembroke Town Center and the MBTA Commuter Rail Station in Hanson.

GATRA has intermodal connections with the Plymouth and Brockton commuter buses at Exit 5 on Route 3. This intermodal connection connects local service with an intercity carrier that travels north to Boston and south to Cape Cod, and to Providence RI. GATRA is in the process of siting an intermodal transportation center in downtown Plymouth.

Figure 6-3: Greater Attleboro and Taunton Regional Transit Authority System

Greater Attleboro and Taunton Regional Transit Authority



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The Massachusetts Bay Transportation Authority (MBTA)

The Massachusetts Bay Transportation Authority (MBTA) bus routes 230 and 240 operate in the region. The MBTA also contracts for the provision of paratransit/demand responsive service for elderly and passengers with disabilities in their service areas. The MBTA 230 services the Montello station and connects to BAT Route 10. The bus provides connections to the Braintree Red Line station, Quincy Adams Station and then proceeds to the Quincy Center station. The MBTA 240 route runs from Avon Center to the Ashmont Red Line station via Crawford Square in Randolph. The MBTA 240 route operates along the same route as BAT’s Ashmont service, route 12. The routes operate seven days a week and on all holidays with more frequent service Monday-Friday.

6.2.2 Demand Response

There are two types of paratransit/demand response services in the Old Colony Region, one that transports persons 60 years and older, the other provides ADA paratransit/demand response service to those with a disability that makes it not possible to use regular fixed route bus service. While the requirements to ride senior paratransit/demand response service is that one must be 60 years old or older, the requirements to ride ADA paratransit/demand response service are more stringent since service coverage and hours of operation are usually more extensive in order to provide the same level of transit service comparable to those capable of using fixed route services. The three Regional Transit Authorities (RTA) providing paratransit/demand response service in the region are Brockton Area Transit Authority (BAT), Greater Attleboro Taunton Regional Transit Authority (GATRA), and the Massachusetts Bay Transportation Authority (MBTA).

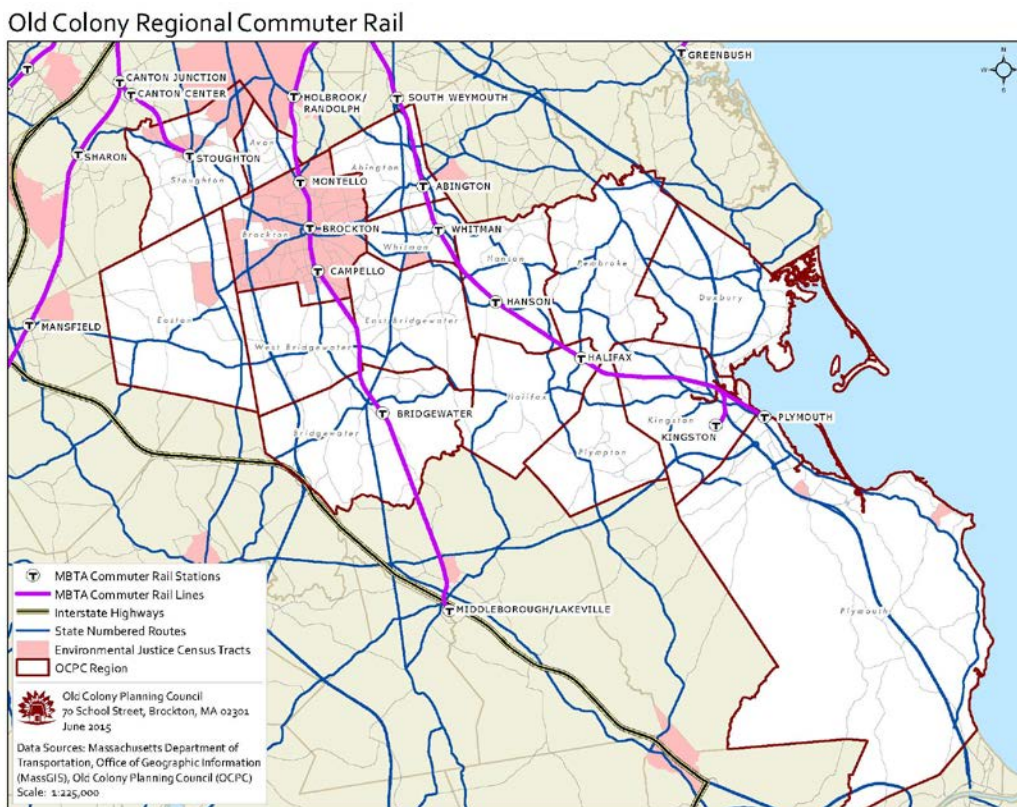
BAT and GATRA are the primary paratransit/demand response services providers in the Old Colony Region, which are supported by additional human services trips provided by the South Shore Community Action Council and 12 local Councils on Aging. In accordance to the *Americans with Disabilities Act (ADA)*, BAT and GATRA provide service within ¼ of a mile of fixed transit routes. BAT alone provides 192,000 paratransit/demand response service trips a year and GATRA provides just over 135,000 paratransit/demand response service trips in its service area. The MBTA does provide paratransit service to the communities of Abington, Avon, Stoughton and the City of Brockton. Figure 6-4 displays the paratransit services area in the Region.

6.2.3 Commuter Rail

Three MBTA Commuter Rail lines operate in the region. These three lines are the Middleborough/Lakeville, Kingston/Plymouth, and Providence/Stoughton. The Commuter Rail lines are highlighted in Figure 6-5. The Commuter Rail lines in the Region handle approximately 7,066 one-way transit trips per weekday.

The Providence/Stoughton line offers service to Stoughton and points north to South Station Monday-Friday and is a very popular line with commuters in the Old Colony Region as it provides direct access to Back Bay in Boston without the need to transfer. The Middleborough/Lakeville line offers daily service through the communities of Brockton and Bridgewater and is the most heavily used line in the Old Colony Region with 3,161 average daily boardings. The Kingston/Plymouth line serves the region’s communities of Abington, Whitman, Hanson, Halifax, Kingston and Plymouth and it too has daily service including holidays. Areas around these transit stations have become opportunities for enhanced redevelopment, and have fostered transit oriented development and the creation of 40R Districts.

Figure 6-5: MBTA Commuter Rail System



The popularity of the Commuter Rail lines has resulted in service and capacity issues. The Providence/Stoughton Line experiences regular delays in service and each line experiences capacity issues due to the number of trains that can operate on the given lines due to freight rail movements, signal problems, and South Station capacity issues. The Commuter Rail stations have large amounts of parking, but some stations experience capacity issues at various times

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throughout the year while other stations remain underutilized. This underutilization of parking at some stations could be the outcome of parking being too aggressively priced or Commuter Rail fares at one station not being in line with other station in the same community. For example there was feedback received during the public survey period for the Regional Transportation Plan were residents of Brockton expressed they do not use the Campello Station in the city due to this station being in a different more expensive fare zone even though it is in Brockton.

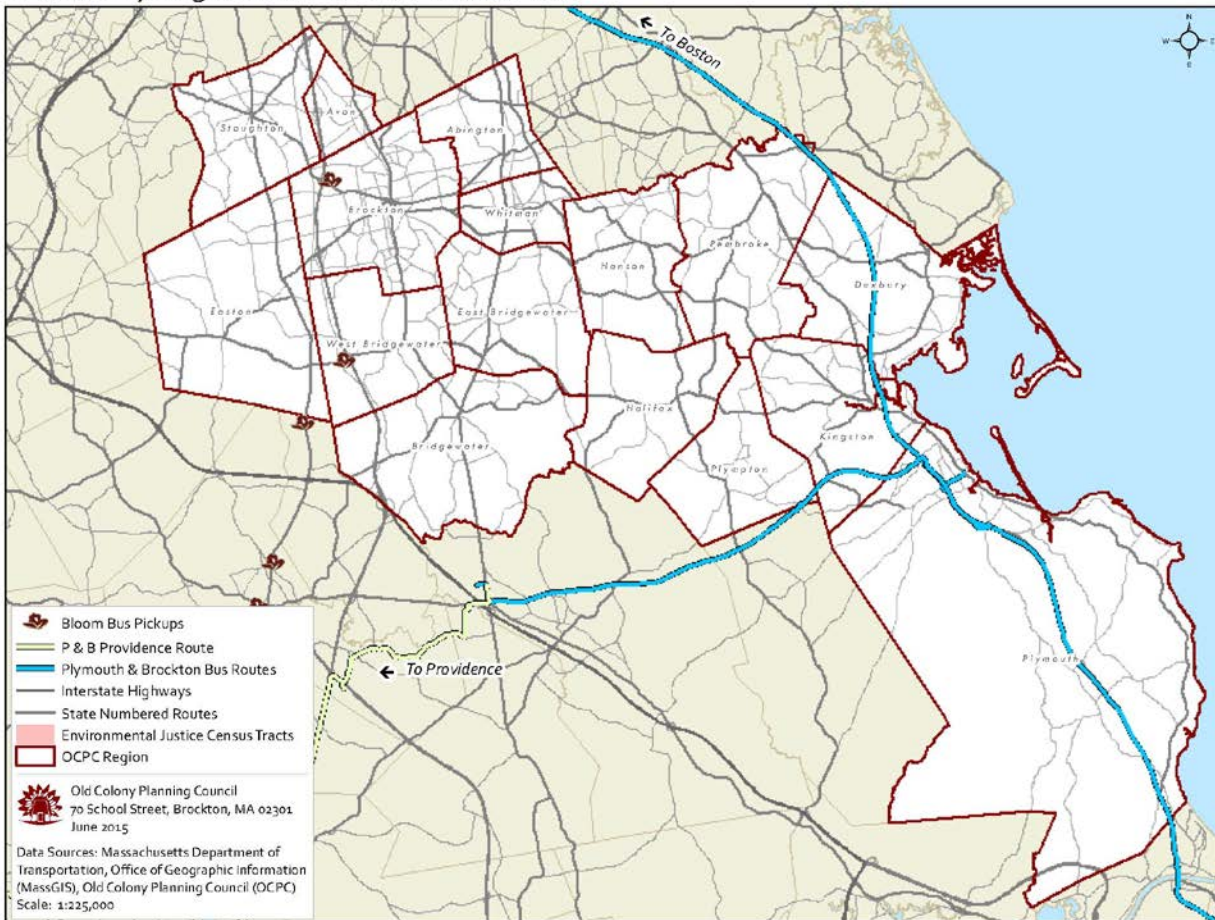
Due to stations being designed primarily as park and ride facilities, the stations are highly automobile dependent with minimal regard to healthy transportation modes. More attention should be paid to non-automobile modes of transportation arriving at Commute Rail station such as walking, bicycling, and public transportation. Sidewalks at and around the stations should be improved for the walking public and for those with mobility challenges. Along with improving pedestrian access to Commuter Rail station, these walking paths to station should be kept in a state of good repair and cleared of debris, snow, and ice to facilitate easy and safe access to stations. While the stations include bicycle parking facilities, they need upgrading. Currently most Commuter Rail stations have simple bicycle racks. Installing more secure bicycle parking facilities like the Park and Pedal facilities found at MBTA subway stations could encourage greater usage of bicycles to access Commuter Rail stations. Going one step further and providing additional space to those that cycle to Commuter Rail stations to also store their commuter bags and other bicycle accessories would encourage more bicycle usage to stations. Regional Transit Authorities servicing MBTA Commuter Rail stations should be provided with more rider accommodations to encourage Commuter Rail passengers to use Regional Transit Authorities to access these stations. More and better information should be present at Commuter Rail station in the Old Colony Region informing rail passengers on what Regional Transit Authorities service the station passengers are at and where they can travel to from the station location. Better sitting areas with adequate shelters to protect passengers from the elements along with next bus arrival information should also be present at Commuter Rail station stops.

6.2.4 Commuter Bus

Plymouth and Brockton Street Railway Company (P&B) and Bloom bus companies provide commuter bus services in the region. P&B is a private company offering fixed route long distance service. On average, P&B carries about 28,000 people from the region to points in Boston, Cape Cod, and Providence, RI. P&B routes generally run north-south with the most frequent trips leaving from Plymouth, Kingston, Rockland, and Duxbury, with terminus locations in Downtown Boston, Logan Airport, and Providence RI. The service predominantly provides work commute and Logan Airport trips. P&B also operates trips south through Cape Cod. In addition to operating its long distance route, P&B is also the contracted operator for GATRA's fixed route service.

Figure 6-6: Regional Commuter Bus System

Old Colony Regional Commuter Bus Service



Bloom provides service to Boston with pick up locations in Brockton (by request) at the Westgate Mall and in West Bridgewater at the park and ride lot located on Route 106, just west of Route 24.

Issues facing Commuter Bus is growing highway traffic congestion which contributes to passenger delays and their lack of promoting service. During the public participation and outreach process for this Plan, most individuals were unaware private commuter bus service existed or where they might be able to catch a bus. Having these private commuter bus companies promote their services more could help improve regional mobility giving residents more choice on how they travel.

6.2.5 Ferry Service

The Old Colony Region only has one ferry operation, operating seasonally during the summer between the Town of Plymouth and Provincetown, making one round trip daily.

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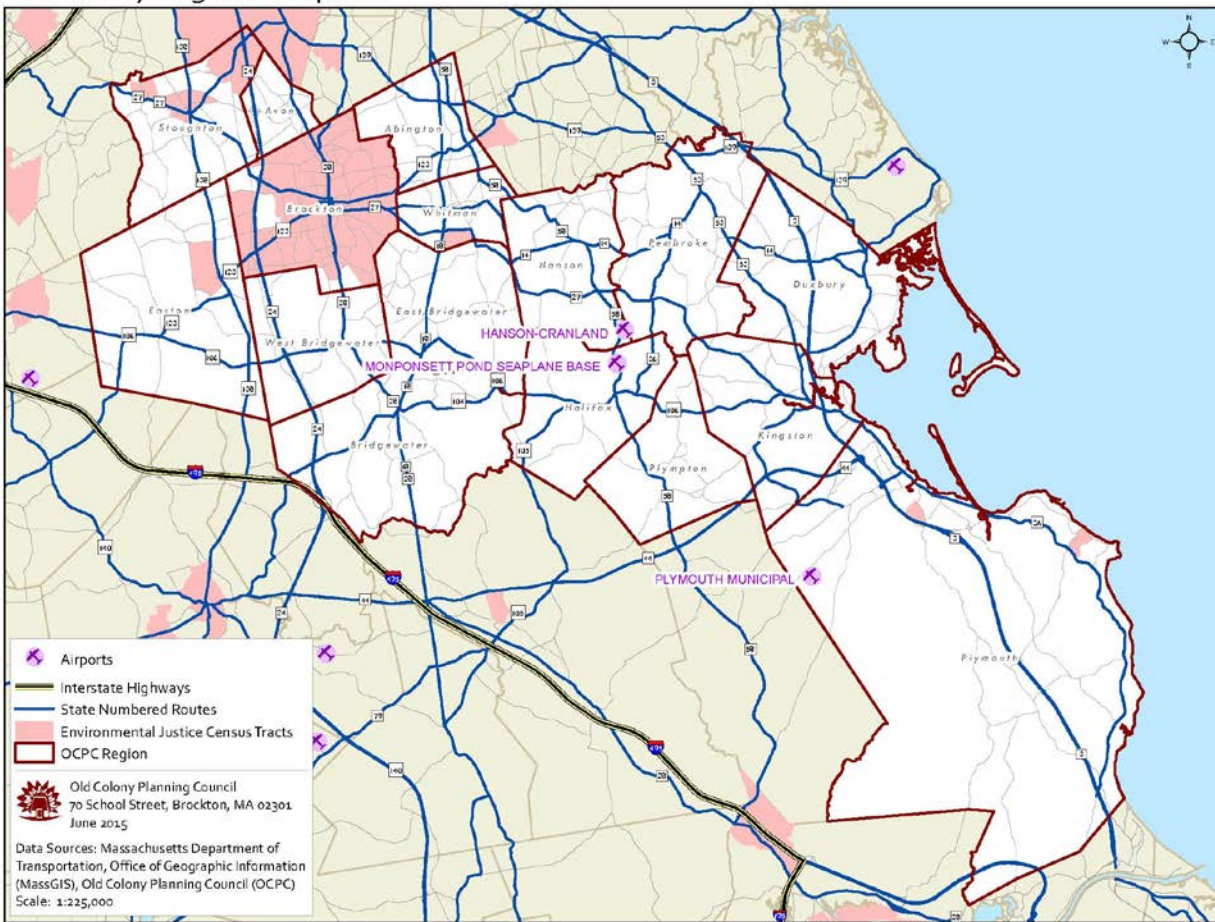
The Commonwealth has recognized the benefits of ferry service and its economic benefits. However, the Commonwealth is struggling to meet the cost of operation and maintenance of ferry service and is looking for some type of public/private partnership, according to MassDOT's 2012 report *Passenger Ferry Transportation in Massachusetts*. The Old Colony Region should work closely with the Town of Plymouth and the Commonwealth to see how it can meet the operation and capital cost of operating ferry service in the region as well as determining where public/private partnerships can be brokered to achieve this goal.

6.2.6 Air Transportation System

There are three airports in the Old Colony Region. Aviation services are provided at the Plymouth Municipal Airport and at two private airports: the Monponsett SeaPlane Base in Halifax and Cranland Airport in Hanson. The region's airports are a vital component of the overall transportation network serving personal, business and recreational purposes, and serve as an important factor in the region's economic development efforts. According to *2010 Massachusetts Statewide Airport System Plan*, the Commonwealth is striving to maintain and grow the airport system as the economy grows and the number of flights arriving and departing continues to climb. In addition to maintaining and expanding the airport system, the Commonwealth goal is to also leverage the economic output the airport system generates. The Old Colony Region should support its regional airport meet the five goals laid out in the statewide plan. These goals include: 1) Meeting FAA applicable design standards. 2) Compliance with Federal, Commonwealth, and Local environmental regulatory requirements. 3) Leveraging economic impacts and benefits of incremental investments in the airport system. 4) Airports should support and promote aviation education programs and conduct community outreach. 5) Integrate with other transportation modes.

Figure 6-7: Airports in the Old Colony Region

Old Colony Regional Airports



Plymouth Municipal Airport

Plymouth Municipal Airport is the only publicly owned airfield in the region, owned by the Town of Plymouth. The airport functions as a general aviation facility serving private operators and individuals. The travel accommodated by the field consists predominantly of recreational and business trips. In addition, three charter services operate out of the field. The facility contains multiple hangars and aviation fuel and repair services. The airport serves the Massachusetts State Police Air Wing, Plymouth County fire planes, and Medflight helicopters.

The airport is in the planning stages of extending the shorter of its two paved runways from a size of 3,350' x 75' to a length of 4,350' x 75' to reduce the need to have to use both runways operating at the same time. Operating both runways at the same time has led to aircraft conflicts and contributes to noise issues. It was also determined through committees and public outreach that having the capability of using both runways for all types of aircraft will reduce the noise burden of anyone residential area taking the brunt of airport traffic.

Halifax: Monponsett Seaplane Base

This is a seasonal facility and is close in proximity to Hanson’s Cranland Airport, which supplies services to the seaplane base. Halifax utilizes the waters of the Monponsett Pond the seaplanes land on an unmarked area on the pond. Dock space and mooring facilities are available, as is flight instruction. Emergency-only fuel and repair services are also available from Cranland. Recreational trips are served at this facility. The airport does not offer scheduled passenger or freight service.

Hanson: Cranland Airport

Hanson’s Cranland Airport is privately owned and publicly accessible. It provides one non-illuminated asphalt runway 1,760 x 60 feet in length. The facility contains seven hangars and emergency-only aviation fuel and repair services. This general aviation facility serves recreational trips. There is no scheduled freight or passenger service. The airport does not offer scheduled passenger or freight service.

6.2.7 Rail Freight Transportation Network

The current rail freight network within the Old Colony Region includes CSX Transportation, which operates on the Middleborough/Lakeville line and the Providence/Stoughton line. CSX has operating rights along these lines, but the Massachusetts Bay Transportation Authority owns the right of way.

According to the Massachusetts State Rail Plan, freight rail volumes are highest in the western half of the state, where CSX is able to run double stack trains. Rail freight volumes are significantly smaller than truck freight volumes in Massachusetts. According to the rail plan, 88.52 percent of the freight in the state is moved by truck, 5.06 percent by rail, 0.14 percent by air, and 6.28 percent by water. According to the rail plan, there has been a decrease in freight volumes in eastern Massachusetts, which presents a challenge in serving consumer markets and businesses as inbound freight rail, especially the intermodal container traffic, transitions from rail to truck to access distribution centers, wholesale trade facilities, and retailers. Figure 6-8 shows rail freight in Massachusetts included in the Massachusetts Freight Plan and based on the federal Freight Analysis Framework. It shows growth in rail freight volumes between Springfield and Worcester, north and south of Worcester, and between Worcester and Boston. Rail Freight in the Brockton rail corridor is not expected to increase substantially, according to the Massachusetts Freight Plan, (based on the Freight Analysis Framework).

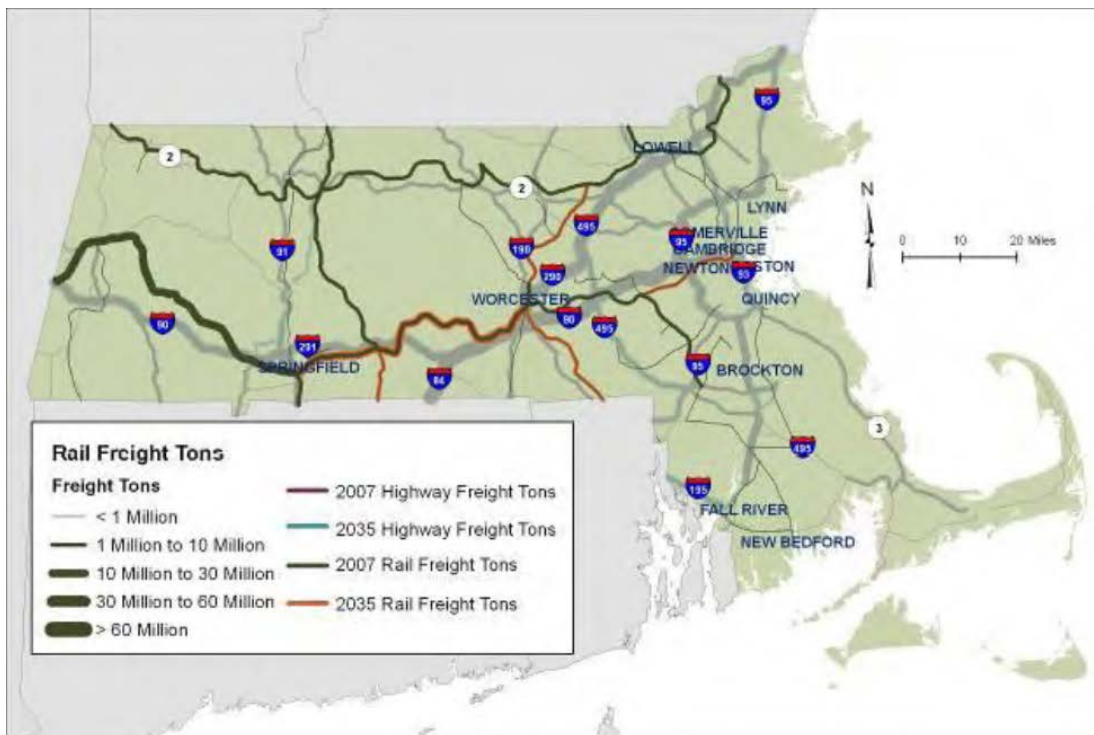
In 2013, the *Preliminary Market Assessment for the Brockton CSX Site* study was completed by a consultant for the Metro South Chamber of Commerce. The 31 acre Brockton CSX site is known as the former Brockton Freight Yard. It is located north of the Brockton downtown adjacent to North Montello Street, with a long frontage on the active rail line but lacks direct connection to the local roadway system. It is bordered by Elliot Street on the north and Court Street (Route 27) to the south, and has not been in use as a rail yard since the 1980’s. The assessment focused on discerning the site’s physical, environmental, and infrastructure strengths and weaknesses, gaining the input of stakeholders, and gathering information on potential customers to discuss potential redevelopment opportunities and outline steps toward

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developing a plan for redevelopment. The study stated that it is possible that intermodal containers could be handled in Brockton on a smaller scale, although the expanded Worcester facility (which now has double-stack capacity to/from New York) will be the focal point for containers. The study concluded that based on the current market and past uses at the site, the most likely types of freight rail uses there would include:

- Secondary freight rail yard for bulk commodities that are not time sensitive
- Warehousing/distribution center (rail access is often a benefit for these facilities)
- Manufacturing company that requires rail shipments, such as a food producer that requires bulk products (this is increasingly rare in MA as most manufacturing companies no longer use rail for inbound or outbound shipments)
- Commodity-specific transfer facility from rail to truck for local company (e.g., to handle flour, corn syrup, rock salt, or other bulk commodities)

Figure 6-8: Freight Rail System



Since the restoration of the Old Colony Commuter Rail lines in the region, freight transportation has been able to benefit from the upgrades in facilities that were necessary with the reintroduction of frequent passenger service from the area. Many of the grade crossings in the area were upgraded and enhanced, in addition to pedestrian walkways and secured fencing to discourage people from crossing. In addition, the Old Colony lines are also part of Operation Lifesaver, a non-profit organization promoting railroad safety to the public. Operation Lifesaver is a national, non-profit education and awareness program dedicated to ending collisions, fatalities, and injuries at highway-rail grade crossings and on railroad rights of way. To accomplish its mission, Operation Lifesaver promotes “the three E’s:”

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- **Education:** Operation Lifesaver strives to increase public awareness about the dangers around the rails. The program seeks to educate both drivers and pedestrians to make safe decisions at crossings and around railroad tracks.
- **Enforcement:** Operation Lifesaver promotes enforcement of traffic laws relating to crossing signs and signals and private property laws related to trespassing.
- **Engineering:** Operation Lifesaver encourages continued engineering research and innovation to improve the safety of railroad crossings.


6.3 Recommendations


6.3.1 Service and State of Good Repair (SGR) Recommendations

Support additional service. The Brockton Area Transit Authority (BAT) recently increased service on certain lines and expanded its hours of operation. BAT should continue to work with the Old Colony MPO to explore how it could expand service hours and the number of trips provided, especially on the weekend, which has been requested by their patrons.

Meet operation needs. The Brockton Area Transit Authority (BAT) annually seeks Commonwealth and Federal transportation grants to finance support equipment and operations costs. BAT should continue to seek this method of funding to meet operational and capital replacement needs. BAT should also continue to work closely with the Old Colony Metropolitan Planning Organization and staff of the Old Colony Planning Council to seek out and secure additional operation and capital funding to meet growing service demand. The Old Colony MPO is committed to working with the Brockton Area Transit Authority to maintain and improve transit system efficiency and capacity.

 **Target and Performance Measure:** Increase miles between breakdowns with passenger interruption on fixed route to 20,000 (standard) within 10 years (currently 18,020) (from BAT Performance Dashboard)

 **Target and Performance Measure:** Increase miles between breakdowns with passenger interruption on demand response to 10,000 (standard) within 10 years (currently 6,452) (from BAT Performance Dashboard)

 **Target and Performance Measure:** Achieve average on-time ranking on fixed-route system of 98% by 2040.

The following table lists the recommended capital replacement schedule needed to maintain Brockton Area Transit and local human coordination services in a state of good repair over the forecast timeframe of this Plan:

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Table 6-1: Recommended Transit Vehicle Replacements

Type of Vehicle	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040
Paratrasnit	41	41	41	41	41
Commuter Buses	1	2	1	1	1
Fixed Route	20	20	20	20	20
SSCAC	23	23	23	23	23

Table 6-2: Projected Cost for Transit Vehicle Replacements

Type of Vehicle	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040
Paratrasnit	\$2,771,600	\$3,944,851	\$4,799,514	\$5,889,343	\$7,104,454
Commuter Buses	\$624,000	\$1,776,293	\$1,080,566	\$1,314,674	\$1,599,402
Fixed Route	\$8,320,000	\$11,841,954	\$14,407,548	\$17,528,985	\$21,326,691
SSCAC	\$1,444,768	\$2,056,355	\$2,501,871	\$3,043,908	\$3,703,380
Total Costs	\$13,160,368	\$19,619,453	\$22,789,499	\$27,776,910	\$33,733,927

Adequately fund transit to provide a safe, reliable, and efficient regional network. The Old Colony MPO will continue to work with BAT in assisting the Authority to secure stable sources of funding and increase funding when appropriate.

- The Old Colony Region must assist the Regional Transportation Authorities in securing operational and capital funding from both the Commonwealth and the Federal Government.
- Assist Brockton Area Transit in Regional Transportation Authorities should reviewing their fare structures ever few years to see if adjustments need to be made to passenger fares.
- . Support the funding of commuter rail operations in the Commonwealth through a statewide funding mechanism.

Continue current outreach programs. BAT should continue its outreach program to educate the residents of the region about the transportation services it offers and destinations it serves to spur additional ridership.

Support the use of Signal Priority in the BAT and GATRA service areas. Work with local municipal officials to allow the use signal priority for the BAT system to increase efficiency and on time performance. The Old Colony Region should require that all new traffic signals have bus signal priority.


6.3.2 Mobility and Livability Recommendations

Expand geographic reach of demand response (paratransit and human services coordination) services. The Old Colony MPO and Old Colony Planning Council staff should work closely with its RTA’s and those private agencies providing paratransit/demand response service to help meet the growing need. It was mentioned in *The Old Colony 2015 Coordinated Human Service Transportation Plan for the Old Colony Region* that public transit service, which

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paratransit/demand service is grouped into, needs to be greatly increased to meet the growing need by an additional 17,000 hours per month in the BAT service area. In the GATRA service area the additional service hours needed to meet demand would be 6,032 hours.

Improve mobility and access to the transit networks, along with the transportation decision planning process, for all users. Eliminate barriers to participation in the transportation decision making process

 **Target and Performance Measure:** Provide translation services and hearing assistance devices upon request for all public meetings, and large font and translation services for all printed materials

Improve mass transit linkages. Every effort should be made to promote improved linkages between mass transit and other modes of transportation. The Old Colony MPO is committed to working with transit providers to identify and study gaps in transit service, and identifying strategies and projects to improve linkages between fixed route transit, demand response transit, and other modes of transportation.


Expand commuter services by private commuter carriers. In order to better meet mass transit needs in the region, the expansion of commuter services by private carriers is encouraged in areas where there is a demand for such services.

Apply Smart Growth and Complete Streets Principles to development in the region.

6.3.3 Intermodal Recommendations

Continue supporting the development of a Plymouth Intermodal Center. GATRA and Plymouth have been in the process of trying to fund the building of an intermodal center that would enhance both commuters and tourist transportation experiences.

Encourage increased use and expansion of commuter parking facilities. The Old Colony staff should work with MassDOT to continue to promote existing commuter parking facilities and develop additional spaces, where needed, for intermodal uses. Furthermore, consistent and adequate bicycle parking should be provided at all transit facilities and park-and-ride lots.

 **Target and Performance Measure:** 100% of intermodal facilities with adequate bicycle parking by 2040

Support the improvement of pedestrian and bicycle safety and access around public transit stations.

6.3.4 Air, Water, and Freight Movement Recommendations

Increase use of smaller general aviation airports. Municipal Airports in the region, such as the facility in Plymouth, have experienced marked growth in the numbers of take-offs and landings in recent years. Both runways at Plymouth Airport have been expanded in the past and the

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shorter of the two runways should be increased in length to increase capacity, promote greater safety, and lessen the impact of noise on residents.

Investigate potential of municipal airports' ability to serve as freight terminals. Currently, there is no scheduled freight service at any of the municipal airports throughout Southeastern Massachusetts. A feasibility study should be considered by the Massachusetts Aeronautic Commission to determine whether there is potential for any of the municipal airports to serve as airfreight terminals. Depending upon the type of freight, such a facility could serve intermodal purposes.

Seek to establish greater public/private partnerships in ferry operations. The Old Colony Region should work with MassDOT, the Old Colony Planning Council, Municipalities, private ferry operators, and those interested in entering the ferry operation market to form better and more productive ferry service.

Increase the level of freight/goods movement by rail in the Old Colony Region. Support such initiatives, which would serve to reduce truck traffic congestion on local highways and local roads.

6.3.5 Planning and Policy Recommendations

Encourage interagency agreements to enhance passenger service. For example, currently the MBTA 230 bus ends at the Montello Station, but extending that service to the BAT Centre, would enhance passenger connections.

Encourage private sector participation in public transit operations. Brockton Area Transit is encouraged to continue joint development initiatives with private sector concerns when feasible and create partnerships between BAT, other RTA's, and private carriers in southeastern Massachusetts to initiate transit service where there is documented unmet transportation need.

7 BICYCLE AND PEDESTRIAN TRANSPORTATION

Facilities for safe, convenient, and efficient bicycle and pedestrian transportation are key components of a well-balanced regional transportation network. Many of Old Colony’s goals, objectives, and policies include supporting a comprehensive and sustainable transportation network fostering non-motorized travel choices.

The bicycle mode of transportation offers personal mobility featuring door-to-door access; often at speeds comparable to auto travel in high-density areas. In recent years, the bicycle has become an increasingly popular healthy mode choice of travel for commuting to school and work, as well as for recreation and exercise. Increasing gasoline prices and a growing focus on “green” lifestyles and sustainability has driven much of this growth in the popularity of cycling. Safe, convenient, and well-designed facilities are essential to encourage bicycle use. Roads designed to accommodate bicyclists with moderate skills will meet the needs of most users, according to the Massachusetts Department of Transportation. Young children and the elderly are primarily the bicyclists who may require special consideration, particularly on neighborhood streets, in recreational areas, and close to schools and senior centers. Moderate skilled bicyclists are best served by:

- Extra operating space when riding on the roadway such as bicycle lanes, useable shoulders, or wide curb lane;
- Low speed streets (where cars and bicyclists share travel lanes); and
- A network of designated bicycle facilities (bicycle lanes, side-street bicycle routes, and shared use paths).

All travelers are pedestrians at some point in their trip, and pedestrians are part of every roadway environment. Pedestrian facilities include sidewalks, paths, crosswalks, stairways, curb cuts and ramps, and transit stops. In some areas, particularly in suburban and rural communities, pedestrians may be sharing the roadway itself or its shoulders.

It is important to understand that there is no single “design pedestrian” and that the transportation network needs to accommodate a variety of pedestrians, including those with disabilities. For example, children perceive their environment differently from adults and are not able to judge how drivers behave. Children typically walk more slowly, have a shorter gait, and have lower eye height than adults. On the opposite end of the spectrum, older adults may require more time to cross a street, desire more predictable surfaces, benefit from handrails in steep areas, and may require places to rest along their route. People who are blind or have limited sight require audible and tactile cues to safely navigate sidewalks and crosswalks. People with limited cognitive abilities may rely on symbols and take longer to cross the street. People using wheelchairs and scooters may be able to cross the street more quickly than someone walking, but may be more difficult to see by a seated driver in a vehicle. It is important to recognize pedestrians exhibit a wide range of physical, cognitive, and sensory abilities, but they all comprise the pedestrians that roadway design needs to accommodate.

7.1 Issues in the Old Colony Region

Some of the Elementary and Middle Schools in the region are not fully taking advantage of the Safe Routes to School Program. The Safe Routes to School program (SRTS) aims to reduce congestion, air pollution, and traffic congestion near participating schools, while increasing the health, safety, and physical activity of elementary and middle school students. As of March 2015, 70% of eligible partner schools in the region are partner schools,

The Old Colony region is generally auto-dependent. Over the last five or six decades, historic and current land use patterns have created demand for a transportation system designed to accommodate automobiles first and non-motorized uses last. Changing demographics, which include an aging population and a more diverse population that includes a wider variety of people who cannot afford the expense of a personal auto (or who choose not to drive), require better and broader choices in transportation services. Mode shift and inter-modalism can help alleviate auto dependence by increasing the use of transit, carpool/vanpool, and non-motorized transportation modes such as bicycling and walking.

Bicycle parking at transit facilities is underperforming in some locations. While most transit facilities in the region provide bicycle parking racks, the number of people biking to transit stations and park and ride facilities remains very low. Minimal security of these racks and a lack of shelter for bicycles may deter would be bicyclists from taking and parking their bikes at these facilities.

The current ADA accessible sidewalk network does not meet the needs of the users. Most of the main roadways in the region have a sidewalk on at least one side. However, there are many smaller roadways, particularly in more rural areas, where sidewalks are not present. In some cases a worn footpath exists and in others pedestrians share the roadway with vehicles. For existing sidewalks, width, surface type and conditions, and curbing conditions vary. In some cases, sidewalks are in disrepair from weathering and vegetation.

Access to major employment centers is constrained due to the region's reliance on the automobile. With the automobile being such an integral part of one's day, major employment centers become congested and decrease the quality of life for those people driving to work. A lack of multi-modal accommodations in major employment centers make it difficult for people to make the transition to a different mode of transportation.

Environmental Justice Areas generally have older infrastructure. The older infrastructure could generally include poor pavement conditions, lack of ADA compliant sidewalks, and lack of proper crosswalk/bike lane markings.

7.2 Existing Conditions

7.2.1 Sidewalks

According to the Massachusetts Road Inventory File, the Old Colony region has over 390 miles of roadway with a left and/or right sidewalk. Most of the main roadways in the region have a sidewalk on at least one side. However, there are many smaller roadways, particularly in more rural areas, where sidewalks are not present. In some cases a worn footpath exists and in others pedestrians share the roadway with vehicles. For existing sidewalks, width, surface type and conditions, and curbing conditions vary. In some cases, sidewalks are in disrepair from weathering and vegetation.

7.2.2 Existing Walking Paths and Trails

Several parks, nature areas, and recreation areas throughout the region feature walking and shared use paths. These areas include:

- Ames Nowell State Park, Abington
- Borderland State Park, Easton
- D.W. Field Park, Brockton and Avon
- Myles Standish State Forest, Plymouth

In addition to these major areas, several smaller parks and conservation areas exist in each of the towns, many providing pedestrian trails and paths. Bridgewater State University has a network of paved footpaths connecting campus buildings, parking areas, and the Bridgewater MBTA Commuter Rail Station.

7.2.3 Dedicated Bicycle Routes

Claire Saltonstall Boston to Cape Cod Bikeway: The Boston to Cape Cod Bikeway (“Claire Saltonstall Bikeway”) is the major bike route in both the Old Colony region and Massachusetts. This facility is approximately 65 miles from Boston to the Cape Cod Canal, and then runs to both Provincetown (about 70 miles from the canal) and Woods Hole (about 20 miles from the canal). Principally, it accommodates long distance recreational trips.

The Bikeway traverses existing roadways with the bike route marked by road signs. This facility was developed to utilize low volume back roads as much as possible. In addition, the bikeway provides bicyclists with considerable opportunities to visit points of interest such as historical sites, shopping districts, and parks. In the years since the bikeway was planned, some of the roads, such Long Pond Road in Plymouth, have had large increases in traffic volume, and significantly more conflict between bicyclists and motorists could be occurring now. The conflicts are more likely on narrow, country-type roadways.

Bay Circuit Trail: The Bay Circuit Trail (BCT) is a two hundred mile long recreation trail connecting parks, open spaces, and waterways in eastern Massachusetts. First proposed in 1929 as an outer “emerald necklace,” the route stretches from Plum Island in Newburyport on the North Shore to Kingston Bay, traversing 50 cities and towns. Approximately 150 miles of the

trail have been completed. The BCT varies in surface type, from earthen hiking trails to paved shared-use trails.

Bay State Greenway (BSG): In its 2008 Massachusetts Bicycle Transportation Plan, MassDOT proposed the formation of a 742 mile statewide bicycle network, called the Bay State Greenway (BSG). A primary network supported by secondary routes throughout the Commonwealth, the BSG is aimed at enhancing the State's existing infrastructure.

7.2.4 Recreational Bicycle Routes

Seaside Bicycle Trail: The Seaside Bike Trail in Plymouth is a 1.5 mile long facility that runs parallel to the Plymouth seashore between Hedge Road (just south of Cordage Park) and Nelson Street (just north of Downtown Plymouth) at the Nelson Street Recreation Area.

7.2.5 Areas of Concentrated Activity

Many of the areas of concentrated activity are located within the traditional downtown areas of the Old Colony communities, such as Downtown Brockton, Downtown Whitman, Stoughton Center, Pembroke Center, etc. Others are centered on transit stations, such as the Montello and Campello stations in Brockton.

7.2.5.1 Abington TOD

The Town of Abington has created a Transit Oriented Development (TOD) around its MBTA Commuter Rail station and the Town's central business district to encourage the development of uses that complement both the existing rail line and the surrounding residential areas. The district encompassed thirty acres around the Commuter Rail station.

The Town of Abington experienced impressive growth between 2000 and 2009, and with new higher-density residential development, the Town has the potential to become one of the larger communities in the region. The Abington MBTA Station has the potential to become a major intermodal transportation center serving the increasing population and economy of Abington and the surrounding towns by containing the following features:

- Commuter Rail (Existing)
- Parking Facility (Existing 400+ Vehicle Lot)
- Enhanced Walkways between Station, Housing, and Central Business District
- Enhanced Pedestrian Amenities at area signalized intersections (Potential)
- Bicycle Lockers (Potential)
- Fixed Route Bus Service by Brockton Area Transit (Potential)

Enhancing pedestrian facilities (well maintained and lighted sidewalks, pedestrian countdown signals at intersections) between the Target Shopping Center on Route 123, the Abington MBTA Station and TOD Zone, and the Central Business District on Washington Street would, in all likelihood, foster and strengthen high-density development around the Station.

7.2.5.2 Downtown Bridgewater

Downtown Bridgewater is a transportation hub in the region, with the intersection of Routes 18, 28, and 104, as well as the nearby location of the Bridgewater MBTA Commuter Rail Station. Development patterns in the area feature a New England Village style town center, with a mix of housing, local businesses, and services. Traffic flows around the town center in an oblong roundabout-like facility.

Bridgewater State University abuts the town center, and is a major generator of pedestrian traffic. Many students living in nearby off-campus housing commute to class by way of walking or biking, and similarly many on-campus students commute to nearby businesses on foot or bike.

Several municipal buildings, including the Town Hall and Public Library are also located within the center and generate pedestrian and bicycle trips. Due to the scarcity of parking, in some cases visitors who arrive by automobile must park some distance away from their ultimate destination, and travel from their parking spot to the destination on foot.

The area can be greatly served by enhanced pedestrian amenities, including pedestrian countdown signals at signalized intersections and raised crosswalks at major crossing points. Bicycle lanes or sharrows may also be considered on the major roadways leading to and from the college, as the college has a significant population of students and faculty alike that live in nearby housing and may be well served by the option to safely bike to the school. The Bridgewater MBTA Station should be included in all bicycle and pedestrian improvements involving the college.

7.2.5.3 Downtown Brockton

Brockton is the largest community in the Old Colony region, and is a center of housing, commerce, industry, and government. The Downtown Brockton area contains all of these types of land use within a tight, concentric high-density core that extends between Court Street and Belmont Street from north to south, and Commercial Street and Warren Avenue from east to west.

The Downtown is a typical urban center with a mix of residential units, offices, and retail and service oriented businesses. Brockton City Hall, Brockton Police Headquarters, the US Post Office, government (county and state) offices, Brockton Area Transit's Intermodal Transportation Centre; and the Brockton Commuter Rail Station are all located within the Downtown. This mix of development over a confined urban downtown generates a large amount of pedestrian trips to occur within Downtown Brockton.

While much has been done already in the Downtown Brockton area, additional facilities could serve to increase safety and security of pedestrians and bicyclists in the Downtown area, including:

- Pedestrian countdown signals at Downtown intersections

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- Better lighting of sidewalks and streetscapes
- Raised crosswalks on Commercial Street, between the Brockton MBTA Station & BAT Intermodal Centre, and in front of the Post Office
- Well maintained, brightly painted crosswalks throughout Downtown Brockton
- Bicycle Lockers at Brockton MBTA Station, BAT Intermodal Centre, and various locations downtown

7.2.5.4 Downtown Stoughton

Stoughton Center is a densely developed area around the intersection of Routes 27, 138, and 139. The Stoughton MBTA Commuter Rail Station is also located in Stoughton Center. Development around the Center features a mix of small, local shops; services; municipal facilities; and housing.

Like the Abington MBTA Station, the Stoughton MBTA Station also has the potential to develop into a major intermodal transportation center serving the population and economy of Stoughton and the surrounding towns by containing the following features:

- Commuter Rail (Existing)
- High Capacity Parking Facility (Existing 400+ Lot)
- Enhanced Walkways between Station, Housing, and Central Business District (Existing and Potential)
- Enhanced Pedestrian Amenities at area signalized intersections (Existing and Potential)
- Bicycle Lockers and Bike Racks (Potential)
- Fixed Route Bus Service by Brockton Area Transit and MBTA (Potential)

7.2.5.5 Downtown Plymouth

Downtown Plymouth is less defined than some of the other downtown areas in the region, but generally extends north to south along the waterfront from Samoset Street (Route 44) to Lincoln Street. In addition to the traditional mix of commercial, residential, and municipal uses, the Downtown area of Plymouth also features historic sites and major tourist destinations such as Plymouth Harbor, Plymouth Rock, Pilgrim Hall Museum, and the Mayflower II.

Plymouth Harbor provides seasonal water borne transportation options to Provincetown, and also serves as an operational fishing port.

Plymouth has a parking management system in the Downtown that directs visitors to park at any one among a network of surface parking lots throughout the area, pay for parking, and walk to their destination.

Safe and efficient pedestrian amenities are critical to the vitality of Downtown Plymouth, as many businesses, tourist attractions, and government offices do not have on-site or readily available nearby street parking. The majority of visitors to and employees in Downtown

Plymouth must park their cars at satellite municipal parking lots and walk the remainder of the trip to their destination.

The area could be greatly served by the following amenities:

- Rectangular Rapid Flash Beacons (RRFB) to better delineate crosswalks
- Bicycle Lockers and Bike Racks around the Downtown
- Pedestrian countdown signals at signalized intersections
- Raised Crosswalks at major mid-block crossing points
- Increased lighting on side streets and alleyways that connect Main Street to Water Street

7.2.5.6 Stonehill College and Route 138

Stonehill College, located on Route 138 in Easton, contains a large on-campus population, and generates some commuting student traffic as well. Immediately to the south of Stonehill College, Route 138 is highly developed with many restaurants, convenience stores and services, and other businesses. This commercial retail generates a large amount of pedestrian traffic originating at Stonehill College, and most of these trips travel back and forth on Route 138.

Safety and security along Route 138 can be enhanced for pedestrians and bicycle riders by:

- Creation of Bicycle Lanes along Route 138 between Stonehill College and through business district
- Enhancement of traffic signals along corridor
- Well-lighted walkways and streetscapes

7.2.5.7 Downtown Whitman

Downtown Whitman is centered on Washington Street, between South Avenue (Route 27) and West Street. A relatively compact area, featuring several businesses, it is flanked by dense residential development on all sides, a large park to the northeast, and town offices and the Whitman MBTA Station three-quarters of a mile to the east. Observations from data collection in the area indicated a large number of pedestrians between Downtown Whitman and the MBTA Station.

Two all-way stop controlled four-legged intersections make up the northern and southern ends of the downtown area. While these “4-Way Stop” sign controlled intersections effectively process traffic in the area, they can present a challenge to pedestrians attempting to cross at the intersection.

7.2.5.8 Pembroke Center

Pembroke Center is a traditional New England community center with a shopping plaza, town offices, a library, and several other free-standing businesses. Low-density residential development surrounds the center.

The shopping center at Route 14 and Route 36 was recently redeveloped. Despite low density residential development, pedestrian activity near the center is likely to increase with relatively fast growth of the town, the newly developed center, and new transit service between the center and the Hanson MBTA Station.

7.2.5.9 Campello and Montello MBTA Stations

The Campello and Montello neighborhoods of Brockton each have an MBTA Station. The Montello Station is located between North Montello Street (Route 28) and Spark Street, just to the south of Howard Street (Route 37). The Campello Station is located off of Plain Street, just to the east of Montello Street (Route 28). Both neighborhoods are very densely developed, and each station generates a large amount of pedestrian traffic. In addition to commuter rail service to Boston, each station is served by Brockton Area Transit fixed route bus service, and the Montello Station is served by MBTA fixed route bus service to Holbrook, Randolph, Braintree, and Quincy.

The Campello Station could be better served by enhanced pedestrian connections to the surrounding neighborhood, as access is currently largely limited to the driveway off of Plain Street.

The Montello Station could be better served by enhanced mid-block pedestrian crossings on North Montello Street (Route 28). The roadway has high traffic volumes through this two-lane cross-section of roadway and increasing speeds as vehicles clear the intersection at Route 37 and travel southbound.

7.2.5.10 Cedarville

Cedarville is a village center of Plymouth located at the southern end of Plymouth, between Exit 2 on Route 3, Route 3A, and Hedges Pond Road. The area is highly commercialized along State Road (Route 3A) between Herring Pond Road and Hedges Pond Road. While much of the residential development in the surrounding area is low-density, a large high-density residential development is located along the southern boundary of the village center, on the east side of Route 3A.

The Town has identified this area as an area with a large amount of pedestrian activity and high-hazard to pedestrians. Route 3A is a wide cross-section with high speeds and no signalized intersections to assist with crossings. Pedestrians crossing the highway ramp system at Route 3 Exit 2 also face a high-degree of hazard with unprotected crossings and high travel speeds.

The following improvements have been identified that could greatly improve safety and mobility for pedestrians in the area:

- Signalize the Route 3 Ramps at Herring Pond Road
- Signalize the intersection of State Road (Route 3A) and Herring Pond Road
- Signalize the intersection of State Road (Route 3A) and Hedges Pond Road
- Enhance mid-block crossings at shopping centers, between Herring Pond Road and Hedges Pond Road, and at White Cliffs

- Improve Roadway Lighting
- Construction of new sidewalks
- Construction of bicycle paths and/or on-road lanes

7.3 Safe Routes to School

The Massachusetts Safe Routes to School (SRTS) program promotes healthy transportation and mode shift for children and parents in their travel to and from school. It educates students, parents and community members on the value of walking and bicycling for travel to and from school.

The Massachusetts Safe Routes to School program is managed by the Massachusetts Department of Transportation. Following a successful pilot program developed by WalkBoston and funded by MassDOT, an expanded program was established in 2005 through MassRIDES, the Commonwealth's travel options program. MassRIDES offers schools technical support to customize programs and training.

Safe Routes programs:

- Establish healthy lifetime habits for students
- Increase children's independence
- Help students arrive at school ready to learn
- Teach safe pedestrian, bicyclist, and driver skills

Safe Routes to School includes, education, encouragement, enforcement, engineering, and evaluation to ensure a comprehensive and successful program to increase walking and bicycling to and from school.


As the title of the program suggests, safety is a central theme concerning the initiatives and goals of the program. Some of these specific initiatives include the design and maintenance of effective school zones, maximizing safety at street crossings, and reducing travel speeds.

The Massachusetts Safe Routes to School program offers schools technical assistance designing, implementing, marketing, and evaluating initiatives tailored to each school's needs and priorities. Participating schools receive free promotional materials to implement Safe Routes to School, plus no-cost educational materials targeted to students, parents, and community leaders. Training prepares school stakeholders to identify school access challenges and design solutions. School partners qualify for infrastructure improvements to enhance safety along school routes.

7.4 Recommendations


7.4.1 Livability and Mobility Recommendations

Support “Complete Streets” Design In All Roadway Projects: Complete Streets are roadways that are designed to support safe, attractive, and comfortable access to all users, including motorists, pedestrians, bicyclists, and transit users. In addition to enhancing safety and mobility, “Complete Street” designed roadways often enhance the surrounding community and environment through traffic calming techniques and vegetated streetscapes. Complete Streets are categorized by wide paved shoulders or separate bicycling lanes; sidewalks separated from the roadway by raised curbing and/or vegetation; well-placed and well-designed crosswalks; raised medians providing crossing refuge; and bulb-outs at intersections to prevent high-speed turning vehicles and shorten crossing distance for pedestrians.


 **Target and Performance Measure:** OCPC’s goal is to have 50% of communities with Complete Streets policies within 10 years.


Improve mobility and access to the pedestrian infrastructure network for all users. There are currently large gaps in the ADA-accessible pedestrian infrastructure network in the region. As the population continues to age, providing access to all users, including those with physical challenges and disabilities will become critically important. All planning efforts should incorporate the needs of all users, and strategies to improve access and reduce gaps in the ADA-accessible network should be incorporated into all transportation planning products.

Encourage/promote walking and bicycle riding as a viable healthy transportation option to automobile commuting and as a means to improve air quality. Where feasible, walking or bicycling to work or to transit facilities instead of driving would reduce “cold starts,” which inject high levels of toxic emissions into the atmosphere with the starting and shutting off of automobile engines. A coordinated effort of local officials, the Massachusetts Highway Department, Regional Planning Agencies and interest groups, should encourage and promote the use of existing designated bicycle routes as a viable healthy transportation option to automobile commuting through public information and awareness efforts.

 **Target and Performance Measure:** Minimum of 2 planning studies in UPWP every 4 years that address access to employment centers

Support bicycle riding as a part of intermodal travel. Coordination between different modes of transportation should include the improvement of bicycle access to public transportation. This includes, but is not limited to, permits to allow bicycles on train cars; external racks to carry bicycles on buses as done in Portland and San Francisco, and bicycle lockers at park-and-ride lots, train stations and bus terminals.

 **Target and Performance Measure:** Achieve at least 15 percent of commuters in the Old Colony region using healthy transportation modes, (transit, walking, bicycling, etc.), within ten years.

 **Target and Performance Measure:** 100% of intermodal facilities with adequate bicycle parking by 2040


Identify, designate and implement additional bicycle paths and routes to be used for both commuting and recreation. Local officials, in concert with state and regional planners, should investigate the development of additional bicycle paths and routes which could safely serve the commuting public. This includes, but is not limited to, the development of abandoned railroad rights-of-way as bicycle paths, and bikeways that connect industrial/business parks, shopping centers, schools and other key destinations.

Enhance bicycle facilities at intermodal facilities (MBTA Stations, BAT Centre, Park and Ride). The potential for MBTA Stations, the BAT Centre, and MassDOT Park and Ride lots to serve as true intermodal facilities can be maximized by enhancing bicycle facilities, including but not limited to: installation of external bike racks on buses that serve these facilities; the installation of bicycle lockers; and bicycle lanes and paths entering and exiting facilities.

Promote/encourage pedestrian ways as a viable healthy transportation option to automobile commuting and means of improving air quality. Where feasible, walking to work or to transit facilities instead of driving would reduce “cold starts,” which inject high levels of toxic emissions into the atmosphere with the starting and shutting off of automobile engines. Support of this travel mode includes, but is not limited to, the creation of pedestrian walkway connections between residential areas, transit facilities, industrial parks, shopping centers, schools and other key destinations.

7.4.2 Safety Recommendations

Promote and increase participation in Safe Routes to School program in the region. Continue partnership with MassDOT to promote to communities and increase participation by eligible elementary and middle schools in the Safe Routes to School Program

 **Target and Performance Measure:** Increase percentage of SRTS Partner Schools to 85% in 10 years.

Encourage/promote safe bicycle riding, and reduce the number of injuries and fatalities associated with bicycle crashes. To help ensure safe travel habits and reduce the number of bicycle crashes, education programs for all road users should be implemented. Coordination of municipalities with the Department of Education, Registry of Motor Vehicles and transportation agencies should be a part of this effort.

Promote the installation of bicycle detection loops at actuated signalized intersection to increase safety for entering bicyclists. Noting that roadways serve both drivers of motorized vehicles and users of bicycles, actuated traffic signals should include detection loops for bicycles to maximize safety for bicycle riders.

Support local initiatives, which enact, implement and enforce laws and regulations regarding pedestrian traffic. The responsibility for pedestrian safety ultimately lies with the local jurisdiction. Communities should utilize safety officers to enforce laws/regulations that

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promote increased pedestrian safety, with emphasis around high activity areas such as transit facilities, schools, and commercial centers. Participants in the process should include police departments, traffic engineers, school and legal system representatives.

Install physical barriers, pavement markings, and other amenities where needed to maximize pedestrian safety. Marked crosswalks, safety islands, street lighting, pedestrian underpasses/overpasses, sidewalks, traffic signals and signage all constitute useful techniques to separate pedestrians from hazardous vehicular traffic. Particular attention should be given to high activity areas such as transit facilities, schools, and commercial centers.

Promote Installation of Pedestrian Countdown Signals at Signalized Intersections – A Pedestrian Countdown Signal consists of a standard pedestrian signal with standard shapes and color, with an added display that shows the countdown of the remaining crossing time. Studies have shown that these types of signals dramatically decrease pedestrian-vehicle conflicts and increases safety for crossing pedestrians. By viewing the numeric countdown display, pedestrians gain a new level of self-protection by the ability to determine how long it takes them to cross a street, and knowing precisely how much time exists on the current signal phase before the “Don’t Walk” alert comes on and the signal proceeds into its next phase. According to a January 2006 article in the ITE Journal, San Francisco experienced a 52 percent reduction in pedestrian injury collisions at the 700 intersections it had retrofitted with the countdown equipment. The Regional Planning Agency and Metropolitan Planning Organization should work with the City of Brockton and other towns in the Region to retrofit signalized intersection with pedestrian countdown signals. Pedestrian countdown signals should be considered with all new signalization projects.

Promote Safer Pedestrian Access Designs in Parking Lots – Pedestrian consideration is often overlooked in design for parking areas of retail, entertainment, and employment centers. Often the pressure to provide as many parking spots as possible or the minimums for zoning regulations eliminates safe pedestrian accommodations from the design process. Once parked and out of the vehicle, pedestrians are often forced to share driveways with motor vehicles. With the boom in popularity of Sport Utility Vehicles and large profile trucks during the 1990’s and early 2000’s, often exiting drivers have very little, if any, visibility of the driveway approaches, making pedestrians virtually invisible. Dedicated pathways between the parking area(s) and building(s) should be provided for pedestrian access. Facility owners should also consider the use of pavement markings, textured surfaces, and other traffic calming devices to further enhance pedestrian safety in parking areas.

Promote Use of Crossing Islands and Medians in Wide Cross-Sections – According to the MassDOT Project Development and Design Guide, fifty feet is generally the longest uninterrupted crossing a pedestrian should encounter at a crosswalk although islands and medians are also appropriate for shorter distances as well. Many multiple lane roadways exceed fifty feet in cross-section width.

7.4.3 Capacity and Efficiency Recommendations

Maintain a Complete and Updated Inventory of Pedestrian Level of Service (PLOS) Rankings:

As part of the Bicycle and Pedestrian Connectivity and Livability Study, Old Colony Planning Council is developing a complete inventory of Pedestrian Level of Service (PLOS) at all signalized intersections in the Old Colony Region. OCPC Staff shall maintain this inventory on a continuing basis, updating information as it becomes available and existing infrastructure changes.

Maintain a Complete and Updated Inventory of Bicycle Level of Service (BLOS) Rankings on State Numbered Routes and Priority Roadways:

As part of the Bicycle and Pedestrian Connectivity and Livability Study, the staff is developing a complete inventory of Bicycle Level of Service (BLOS) on the state numbered route network and other roadways identified as priority routes by community representatives and/or the Regional Bicycle and Pedestrian Taskforce. OCPC Staff shall maintain this inventory on a continuing basis, updating information as it becomes available and existing infrastructure changes.

7.4.4 Environmental Justice Recommendations

Target pedestrian and bicycle infrastructure improvements in environmental justice areas.

Transportation planning efforts should include increase mobility and safety for pedestrian and bicycle infrastructure access in high minority population and low-income population areas.

7.4.5 Planning and Policy Recommendations

Coordinate efforts to improve bicycle facilities with surrounding municipalities and regional agencies.

To help form a more complete and contiguous network of bicycle facilities in the region and southeastern Massachusetts, local agencies should coordinate efforts with agencies and organizations outside the region. This includes, but is not limited to, researching the existing bicycle facilities of surrounding towns before formalizing new bikeways, and coordinating public outreach programs to help minimize the cost of these efforts.

Support local, regional, and state initiatives and legislation that create or maintain bicycle infrastructure and safety.

To best serve the greater good and needs of the public for a safe and secure transportation system, support and endorsement will be provided to all initiatives and legislation (local/regional/state/federal) that result in the implementation of bicycle facilities, ease congestion, promote recreation, and increase safety and security for bicycle users.

8 ENVIRONMENTAL QUALITY, CLIMATE CHANGE, HAZARDS, AND ENERGY

The Old Colony region contains many areas of environmental and historical significance that the residents and visitors enjoy. The transportation system provides access to a wide variety of these significant areas and minimizing the negative impacts from transportation is essential to ensuring longevity.



Figure 8-1: Jones River, Kingston

The Old Colony MPO continually works with federal, state, and local environmental partners to preserve open space; to protect wildlife habitats; to promote energy conservation and production; to provide opportunities for outdoor recreation; and to properly mitigate the impacts to the environment from the transportation system.

The increased use of fossil fuels has been growing at an alarming rate and has come to be relied upon as the primary source of energy worldwide. According to the U.S. Energy Information Administration (EIA) almost 82% of all energy consumed in the United States in 2014 was in the form of fossil fuels. Moreover, the increased number of Greenhouse Gases (GHGs) being released into the atmosphere has only intensified the greenhouse effect causing changes in the world's climate.

8.1 Issues Facing the Environment in the Old Colony Region

Antiquated transportation facilities cause traffic congestion which contributes to air pollution

Older roadways, bridges, and intersections that cannot accommodate the current traffic demand cause traffic congestion. The automobile emissions resulting from the traffic congestion is one of the primary contributors to air pollution.

The transportation sector continues to be one of the highest contributors of Greenhouse Gas emissions

Fossil fuels are the largest source of greenhouse gas emissions, a leading cause of global warming and climate change. The transportation sector continues to be reliant on fossil fuels and the vehicle miles traveled continues to rise.

Fossil fuel powered vehicles are still the most common types of motorized transportation

Despite the emergence of alternative fuel vehicles, the infrastructure needed to accommodate these types of vehicles remains insufficient.

8.2 Metropolitan Planning Organizations and the Global Warming Solutions Act

The Commonwealth's Global Warming Solutions Act (GWSA) of 2008 requires statewide reductions in greenhouse gas (GHG) emissions of 25 percent below 1990 levels by the year 2020, and 80 percent below 1990 levels by 2050. As part of the GWSA, the Executive Office of Energy and Environmental Affairs developed the Massachusetts Clean Energy and Climate Plan (CECP), which outlines programs to attain the 25 percent reduction by 2020 – including a 7.6 percent reduction that would be attributed to the transportation sector.

The Commonwealth's thirteen metropolitan planning organizations (MPOs) are integrally involved in helping to achieve greenhouse gas reductions mandated under the GWSA. The MPOs work closely with the Massachusetts Department of Transportation (MassDOT) and other involved agencies to develop common transportation goals, policies, and projects that would help to reduce GHG emission levels statewide. For example, one of the programs in the CECP is MassDOT's sustainability initiative known as GreenDOT. GreenDOT policy goals were developed in accordance with the GWSA, and are as follows:

- Reduce greenhouse gas (GHG) emissions
- Promote the healthy transportation modes of walking, bicycling, and public transit
- Support smart growth development

The Old Colony MPO shares in these goals and is working to meet the specific requirements of the GWSA regulation – *Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation (310 CMR 60.05)*. The purpose of this regulation is to assist the Commonwealth in achieving their adopted GHG emission reduction goals by:

- Requiring MassDOT to demonstrate that its GHG reduction commitments and targets are being achieved
- Requiring each MPO to evaluate and track the GHG emissions and impacts of its Regional Transportation Plan and Transportation Improvement Program
- Requiring each MPO, in consultation with MassDOT, to develop and utilize procedures to prioritize and select projects in its RTP and TIP based on factors that include GHG emissions and impacts

Meeting the requirements of this regulation will be achieved through the transportation goals and policies contained in the 2016 Regional Transportation Plan, the major projects planned in the RTPs and the mix of new transportation projects that are programmed and implemented through the Transportation Improvement Program. The GHG tracking and evaluation processes enable the MPOs to identify the anticipated GHG impacts of the planned and programmed projects, and also to use GHG impacts as a criterion in prioritizing transportation projects. This approach by the MPO is consistent with the greenhouse gas reduction policies of promoting healthy transportation modes through prioritizing and programming an appropriate balance of roadway, transit, bicycle and pedestrian investments; as well as supporting smart growth development patterns through the creation of a balanced multi-modal transportation system. All of the MPOs and MassDOT are working toward reducing greenhouse gases with plans, actions, and strategies that include (but are not limited to):

- Reducing emissions from construction and operations
- Using more fuel-efficient fleets
- Implementing and expanding travel demand management programs
- Encouraging eco-driving
- Providing mitigation for development projects
- Improving pedestrian, bicycle, and public transit infrastructure and operations (healthy transportation)
- Investing in higher density, mixed use, and transit-oriented developments (smart growth)

8.3 Regional GHG Tracking and Evaluation in RTPs

MassDOT coordinated with MPOs and regional planning agency (RPA) staffs on the implementation of GHG tracking and evaluation in development of each MPO's 2012 RTPs, which were adopted in September 2011. This collaboration has continued for the MPO's 2016 RTPs and 2016-19 TIPs. Working together, MassDOT and the MPOs have attained the following milestones:

- Modeling and long-range statewide projections for GHG emissions resulting from the transportation sector for use before final RTP endorsement. Using the Boston MPO's regional travel demand model and the statewide travel demand model for the remainder of the state, GHG emissions will be projected for 2020 No-Build and Build conditions, and for 2040 no-build and build conditions. The results of this modeling will be available before the endorsement of this RTP and the MPO staff will present on the results to the MPO membership before a vote on endorsement.
- All of the MPOs will include GHG emission reduction projections in their RTPs, along with a discussion of climate change and a statement of MPO support for reducing GHG emissions as a regional goal.

MassDOT, using its statewide travel demand model, will provide the Old Colony MPO with statewide estimates of CO₂ emissions resulting from the collective list of all recommended projects in all the Massachusetts RTPs combined (and supplemented by CO₂ emission reduction results for smaller, "off-model" projects supplied by the MPO). Emissions will be estimated

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using the new (2014) MOVES model, and also incorporate the latest planning assumptions including updated socio-economic projections for the Commonwealth.

The project mix from this RTP (and all other RTPs) – modeled for both 2020 and 2040 using an Action (Build) vs. Baseline (No-Build) analysis to determine the CO₂ emissions attributed to all MPO’s mix of projects and smart-growth land use assumptions – is expected to show a neutral shift toward meeting the statewide greenhouse gas emissions reduction goal of 25 percent below 1990 levels by the year 2020, and 80 percent below 1990 levels by 2050. The reason for the anticipated neutral shift is that early indicators have shown that major infrastructure projects, both individually and collectively, would not trigger a significant change in GHG emission levels.

Working closely with MassDOT, the Old Colony MPO continues to make efforts toward progress through planning activities to meet the GHG reductions targets and complying with the requirements of the GWSA. As part of this activity, the MPO will provide further public information on the topic and will continue to advocate for steps needed to accomplish the MPO’s and Commonwealth’s goals for greenhouse gas reductions.

8.3.1 July 2015 Statement on Conformity-Related Emissions Analysis

All the Massachusetts MPOs and MassDOT continue to meet the requirements of air quality conformity according to the Code of Federal Regulations, and as evaluated through inter-agency consultation. Specifically:

On March 6, 2015, (80 FR 12264, effective April 6, 2015) EPA published the Final Rulemaking, “Implementation of the 2008 National Ambient Air Quality Standards (NAAQS) for Ozone: State Implementation Plan Requirements; Final Rule.” This rulemaking removed transportation conformity to the 1997 Ozone NAAQS (the standard referenced by CLF and the subject of a 12/23/14 DC Circuit Court decision).

Link to Final EPA Rulemaking: <http://www.gpo.gov/fdsys/pkg/FR-2015-03-06/pdf/2015-04012.pdf>

Since the RTPs have been developed, reviewed, and will be approved after April 6, 2015, air quality conformity determinations to the 1997 Ozone NAAQS are no longer required, as those standards and all associated area designations have been permanently replaced by the 2008 NAAQS, which (with actually a stricter level of allowable ozone concentration than the 1997 standards) no longer designate Massachusetts as a non-attainment area(s) for ozone (except for Dukes County – see below).

Through the Interagency air quality consultation process (involving U.S. DOT, EPA, MassDEP, MassDOT, and the MPOs) the latest EPA rulemakings, the referenced court decision, ozone standards and area designations were all reviewed. Specific transportation conformity requirements in Massachusetts for this RTP round are as follows:

- No conformity determination is required for the 2008 Ozone NAAQS, as Dukes County (the only designated non-attainment area) is classified as an “isolated rural nonattainment area” and therefore only needs to evaluate transportation conformity when the Martha Vineyard Commission has a “regionally significant” project that would trigger conformity.
- The Boston carbon monoxide attainment area with a current maintenance plan in place (with a carbon monoxide motor vehicle emission budget) will prepare a carbon monoxide air quality analysis for the Boston Area (nine communities).
- The Lowell, Waltham, Worcester and Springfield Areas are classified attainment with a limited maintenance plan in place. No regional air quality analysis is required in limited maintenance plan areas as emissions may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that such areas will experience so much growth in that period that a violation of the carbon monoxide NAAQS would result. Therefore, in areas with approved limited maintenance plans, Federal actions requiring conformity determinations under the transportation conformity rule are considered to satisfy the “budget test.” All other transportation conformity requirements under 40 CFR 93.109(b) continue to apply in limited maintenance areas, including project level conformity determinations based on carbon monoxide hot spot analyses under 40 CFR 93.116.

In consideration of the comments received, combined with MassDOT’s greenhouse gas (GHG) reporting requirements for the Commonwealth’s Global Warming Solutions Act (310 CMR 60.05), MassDOT will conduct a “conformity-related” emissions analysis for ozone precursors, consistent with the 1997 NAAQS standards (currently superseded by the 2008 NAAQS). This emissions analysis will be for informational purposes only (as it is currently NOT federally required), and will be contained in a separate air quality document (also to include GHG emissions analysis) that will be completed at the end of August 2015 – the results of which will then be available to the MPOs, the Massachusetts Executive Office of Energy and Environmental Affairs (and affiliate agencies), and all other interested parties.

8.4 The Environment around Us

The Old Colony region is a unique area of the Commonwealth that is home to a wide variety of lakes, ponds, streams, brooks, parks, wildlife features, coastline attractions, agriculture, and other recreational opportunities. These amenities make the region an attractive place to live, work, and play.

Planning staff for the Old Colony MPO consulted with the Conservation Law Foundation and the Massachusetts Department of Fish and Game for their input on the impacts of this Regional Transportation Plan on the natural environment. Staff also solicited input from the Massachusetts Department of Environmental Protection (DEP), the Massachusetts Department

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of Transportation (MassDOT), the Massachusetts Environmental Protection Act, the Massachusetts Department of Energy Resources (DER), the Executive Office of Energy and Environmental Affairs, the Massachusetts Emergency Management Agency (MEMA), the Massachusetts Audubon Society, and local environmental officials from our member communities. Furthermore, indivisibly proposed transportation projects are subject to review under the Massachusetts Environmental Policy Act (MEPA) through which impacts to the environment are assessed and mitigated as appropriate.

8.4.1 Air

Driving automobiles, burning fossil fuels, and industrial activities all impact air quality. These activities add gases and particles to the air we breathe and when these gases and particles accumulate in the air in high enough concentrations, they can have harmful impacts on our environment.

Greenhouse gases are of particular concern due to their role in climate change. Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases are created and emitted solely through human activities primarily through the burning of fossil fuels. Greenhouse gases become trapped in the atmosphere and create a “greenhouse effect” which raises the planet’s temperature. This warming results in a wide variety of impacts including, but not limited to: flooding, droughts, abnormal weather patterns, and long term climate change.

Increasing development in areas that are accessible only by automobile translates to people exclusively relying on automobiles to access vital services.

8.4.2 Land

Generations ago, much of the Old Colony region’s landscape was a patchwork of farms and productive woodlands. People raised on farms were connected to the ebb and flow of life throughout the seasons. Planting and harvesting, shearing and slaughtering, sugaring and cutting cordwood linked our communities, our health, and our very existence to the soil. Development pressures have resulted in many of the farmlands in Southeastern Massachusetts becoming home to housing or commercial enterprises. As a result, much of the green space has disappeared and therefore, direct impacts from vehicles are more prominent.

Historically, regional growth decentralized the population and consumed available land at a high rate. Over the past two decades, communities in the northern half of the region experienced substantially less growth than areas in the southern half of the region mostly due to the availability of developable land, which has primarily been in the form of low to moderate density single family homes. This lower-density development combined with the cul-de-sac nature of many subdivisions and the typical scattering of public and commercial uses, increases local travel demands.

The majority of the dense multi-family developments are generally situated near town centers or in close proximity to public transportation. However, the densities of new neighborhoods

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will continue to drop and land consumption per unit will continue to rise as long as communities increase the area requirements on undeveloped land to an acre or more. In addition, many communities allow large commercial developments in an effort to offset the burden that local residents face in property taxes to provide funding for local services. This becomes a regional problem when these large developments generate large amounts of vehicular trips, thus increasing the exposure of the environmentally sensitive areas to pollutants. Increased development pressures in the southeastern Massachusetts region put environmentally sensitive areas in jeopardy.

8.4.3 Water

Massachusetts' lakes, rivers and coastal waters are valuable natural resources that provide wildlife habitat and recreational opportunities. Wetlands are of particular importance in the region as they help clean drinking water supplies, prevent flooding and storm damage, and support a variety of wildlife. Coastal wetlands are directly adjacent to the ocean and include beaches, salt marshes, dunes, coastal banks, rocky intertidal shores, and barrier beaches.

Wetlands protection is important to the preservation of wildlife habitat, protection of public and private water supplies, flood prevention and attenuation, lessening of storm damage and prevention of groundwater contamination. Wetlands have sensitive, complex ecosystems, which can easily be adversely influenced by transportation facilities.

8.4.4 Wildlife

Historically, roadways in the Old Colony region were often located along rivers and near wetland areas. These roads cross a number of bridges and culverts that allow vehicles to cross over the bodies of water that connect wildlife habitats. Generally, these crossings were designed solely to accommodate the automobile and therefore have created habitat fragmentation and in some cases habitat loss. Wildlife attempting to cross over the roadway often created conflicts with automobiles resulting in threats to their population as well as motorist safety.

8.5 Stormwater Management

In Massachusetts, polluted stormwater runoff and discharges in urbanized areas cause serious water-quality problems. Polluted runoffs to waterbodies can negatively affect aquatic plant and animal life in streams and lakes. The effective management of stormwater is critical in protecting the quality of the natural environment adjacent to the roadway. Stormwater can become a transportation system for pollutants such as car antifreeze, motor oil, and salt and sand from de-icing operations, all of which can be deposited untreated into waterways.

The untreated runoff poses a major threat to water quality and is identified as a major source of nonpoint source pollution (NPS). Nonpoint source pollution or "polluted runoff" - which enters our water bodies from septic systems, agricultural uses and runoff from roads, parking lots, construction sites, lawns and other locations - is now the dominant cause of water quality

problems to our lakes, rivers and coastal areas. Point sources still have significant impacts in certain water bodies, but across the state nonpoint source pollution affects more total miles and acres of water. Although these pollution sources are lumped under the single heading of nonpoint sources, in fact there are a huge variety of nonpoint sources from farms to parking lots, which result from a similarly wide range of activities, from cars with leaking oil to construction of new structures. It is easier and less costly to prevent problems from occurring than it is to fix them after they occur.

The pollution of the marine environment, as a result of roadway runoff, can impact coastal resources and economies. Protecting water resources is important for a better quality of life, economic development, recreational activities, wildlife and plant protection, and public/private water supplies.

8.6 Climate Change

One of the largest threats to the environment is the threat of climate change. Throughout its history, the Earth’s climate has endured many changes within a wide spectrum, from the extremes of ice ages to prolonged periods of extreme heat and warmth. These changes in climate can last from a period of decades to millions of years. Changes in climate can affect natural ecosystems, as well as the human economies and cultures that depend on them.

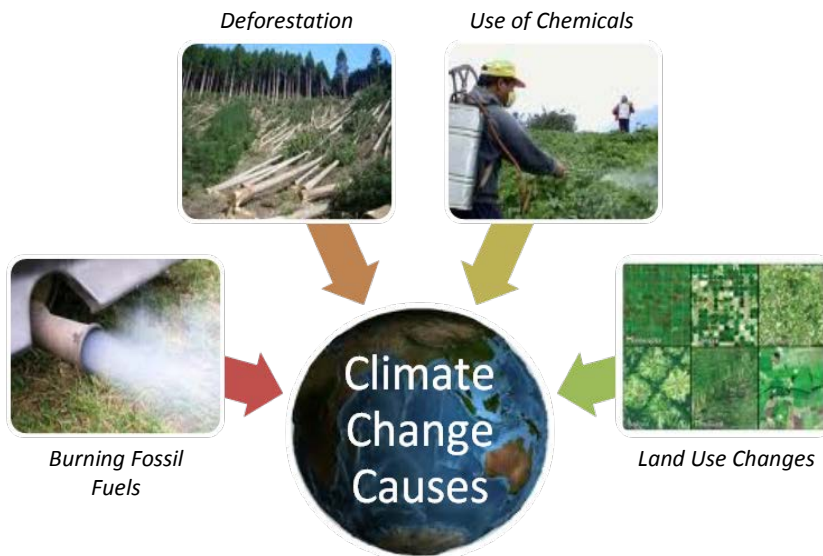


Figure 8-2: Causes of Climate Change

The increased use of fossil fuels has been growing at an alarming rate and has come to be relied upon as the primary source of energy worldwide. According to the U.S. Energy Information Administration (EIA) almost 82% of all energy consumed in the United States in 2014 was in the form of fossil fuels. Other contributing factors to climate change are increased deforestation, the increased use of chlorofluorocarbons, and changes in land use patterns. Each of these man-made activities has contributed to the marked increase of greenhouse gases (GHGs) in the

Earth’s atmosphere. While GHGs consist primarily of water vapor, they also contain methane, carbon dioxide (CO²), nitrous oxide (NO²) and fluorinated gases. These gases form a natural “greenhouse effect” on the planet, where heat is trapped inside the Earth’s atmosphere making it a habitable place for life. The increased number of GHGs being released into the atmosphere has only intensified the greenhouse effect, which has increased the temperature of the planet and begun to cause changes in the world’s climate.

8.6.1 Impacts of Climate Change on the Transportation System

Climate change will only increase both the intensity and severity in which natural hazards affect the region. While occasionally flooding, late summer hurricanes, winter storms and small wildfires are all part of life in the region, they are for the most part at a manageable level. Other threats, such as tornadoes, earthquakes, and landslides are far less common. Each of these events, which will only intensify in their frequency and severity with climate change, can have disastrous impacts across the region and has the potential to wreak havoc on the entire transportation system. Three of the most common means of travelling in the Old Colony region (road and rail) are particularly susceptible to climate change and its resulting increases in precipitation, storm activity and temperature.

Roads and Bridges

The highway network is the most vital part of the transportation system in the Old Colony region, as it is used daily by almost all of the region’s 320,000 residents who rely on it to get their jobs, shopping and social activities. The roads and bridges in the in the Old Colony region are some of the oldest in the country and when combined with severe weather events, this infrastructure is susceptible to major damage.



Figure 8-3: The Bridge Street Bridge at the Matfield River in Bridgewater as a result of extreme flooding in March, 2010.

The most immediate impact of more intense precipitation is increased flooding of roadways, especially those located within 100 and 500 Year Flood Zones as well as those areas along the

coastline. While potential changes in average annual precipitation are likely to have little impact, an increase in the intensity of individual extreme rainfall events may have significant implications. An increase in the frequency of extreme precipitation events will result in more frequent short-term flooding and bridge scour, as well as more culvert washouts that exceed the capacity of the current stormwater management infrastructure.

While most of the Old Colony region is located inland, the coastal communities of Duxbury, Kingston and Plymouth must also deal with the potential rise in sea level. According to the Transportation Research Board (TRB), expected sea level rise will aggravate flooding because storm surges will build on a higher base, reaching farther inland. In fact, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report on North America identifies coastal flooding from expected sea level rise and storm surge, especially along the Gulf and Atlantic coasts, as one of the most serious effects of climate change.

Higher sea levels and storm surges can also erode road bases and undermine bridge supports. The loss of coastal wetlands and barrier islands will lead to further coastal erosion due to the loss of natural protection from wave action. Additionally, strong winds from storms can also damage highway signs, traffic signals, and luminaries throughout the area. More significant safety and operational impacts are likely to be caused from debris blown onto roadways and from crashes precipitated by debris or severe winds.

The roadways and bridges in the Old Colony region are also exposed to a wide-range of temperatures, from the extreme heat and humidity of the summer months to the freezing cold and snow of the winter. According to the U.S. Global Change Research Program, impacts related to projected changes in average temperatures appear to have only moderate implications for bridges and highways, while increases in extreme heat may be significant. Longer periods of extreme heat may compromise pavement integrity, such as softening asphalt and increasing rutting, the buckling of pavement (especially older, jointed concrete), and flushing or bleeding of asphalt from older or poorly constructed pavements. In addition, an increase in the freeze–thaw conditions may occur, creating frost heaves and potholes on roads resulting in load restrictions on certain bridges and roads to minimize damage. Extreme heat can also cause the thermal expansion of bridge joints, which adversely affects bridge operation. This will generally lead to increased maintenance costs wherever pavement thermal tolerances are exceeded. Extreme heat during the summer is also likely to increase the number of wildfires, threatening communities and infrastructure directly and bringing about bridge and road closures in affected areas.

Rail

Rail is the other common form of transportation in the region. The primary rail system in the region is the MBTA Old Colony Commuter Rail, with most of its 14 stations in the region located in low-lying sites. Some stations and rail lines are located in or near mapped floodplains, as is the case in the Town of Whitman, where the station is adjacent to a 100 year flood zone and the track in the southern portion of the town crosses a mapped flood plain. These facilities, however, were designed for their sites and are unlikely to be affected by local flooding. Other

concerns with rail lines include extreme heat that may cause the track to buckle and cause derailments and storms that can knock down signs and potentially cause safety issues.

The interruption of rail traffic is likely to become more common with more frequent flooding. Likely impacts include track inundation, erosion of the track subgrade and the rotting of wooden crossties. Erosion of the subgrade can wash away ballast and weaken the foundation, making the track unstable for passage of heavy locomotives and railcars. Wind may impact the railroad signs, signals, and grade crossings, which has the potential to increase rail accidents at grade crossings.

8.7 Energy

The nation's continued reliance of fossil fuels cannot be sustained, as these finite, non-renewable resources will eventually disappear. In addition to being finite resources, fossil fuels are the largest source of greenhouse gas emissions, a leading cause of global warming and climate change. To accommodate the ever increasing demand for energy, while managing a depleting supply of fossil fuels, alternative forms of energy need to be developed. The best forms of alternative energy sources are ones that are sustainable, renewable and not a detriment to the environment.

8.7.1 Solar Power

Solar power generated in Massachusetts has grown exponentially in recent years. In 2010, just 22.97 megawatts of solar power was installed throughout the state. In just four short years, the amount of solar installed increased ten-fold to 269.11 megawatts in 2014 and is well on its way to meeting the goal of 1,600 megawatts by 2020. The bulk of this solar power is generated through the use of solar photovoltaic (PV) panels, which are most common on the rooftops of buildings. An example of solar power in the Old Colony MPO region is the solar panels on the BAT Intermodal Centre in Brockton (Figure 8-4).



Figure 8-4: Solar Panels on the BAT Intermodal Centre in Brockton

8.7.2 Wind Power

Wind power is a viable form of renewable energy in the Commonwealth both on land as well as offshore. In the Old Colony MPO region, the MBTA has taken a leading role in the development of wind energy via the development of two projects. The first project was the construction of a

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100kW wind turbine at the Kingston Layover Facility. The output from the 100 kW turbine is an effective match for the facilities estimated annual electric load of 255,000 kWh/year. The second project is the construction of a 600kW wind turbine in Bridgewater along the Lakeville/Middleborough Line. This turbine is expected to save the MBTA an estimated \$195,000 annually on its electricity bill. These wind energy turbines provide energy to support the plugging-in of trains for storage, maintenance and passenger waiting facilities.

8.7.3 Alternative Fuels

According to the U.S. Environmental Protection Agency, the transportation sector alone accounted for about 27% of total U.S. GHG emissions in 2013, making it the second largest source of GHG emissions, behind only electricity generation at 31%. Despite the fact that automobiles are more fuel efficient now than any other time in history, greenhouse gas emissions from the transportation sector have increased by 16% since 1990. This is due to the fact that vehicle miles travelled increased 35% since 1990. It should also be noted that nearly 97% of transportation greenhouse gas emissions came through the direct combustion of fossil fuels, making the transportation sector the largest end-use sector emitting of carbon dioxide (CO₂), the most prevalent greenhouse gas.

To support an increase in alternative fuels, the state of Massachusetts passed the Massachusetts Clean Energy BioFuels Act in 2008. The legislation encourages the growth of an advanced biofuels industry as part of the growing clean energy technology sector in Massachusetts. In nation-leading provisions, this legislation gives preferential tax treatment to non-corn-based alternatives to ethanol, requires biofuel content in all diesel and home heating fuel in the state, and proposes a new fuel standard for the region that will encourage a range of emissions reducing technologies for cars and trucks.

More recently, the state of Massachusetts signed the Zero Emission Vehicle (ZEV) Memorandum MOU on October 24, 2013 with seven other states. The MOU sets a goal of having 3.3 million ZEVs on the road by 2025 – with 300,000 of those ZEVs in Massachusetts. The signatory states are working together to promote readiness for the deployment of electric vehicles (EVs) and the establishment of a robust network of charging infrastructure.

8.8 Recommendations

8.8.1 Livability and Environmental Sustainability Recommendations

Support Livable and Sustainable Land Use Strategies

The Old Colony MPO recognizes the threat to environmentally sensitive areas and works with communities to make environmentally and economically sound land use decisions. The Old Colony MPO promotes and supports transportation and land use plans that support integrated, multimodal transportation strategies, including the use of transit, ridesharing, bicycling, and walking.

Reduce dependency on fossil fuels

Promote research, development and implementation of standards, policies, and programs to reduce fuel consumption and the increase investments in alternative fuels.

Minimize negative environmental impacts of the transportation system

Support the development of new and improved designs and Best Management Practices (BMP) to reduce the contamination of water resources from transportation facilities and projects.

Encourage the Research and Usage of Alternative Energies

The Old Colony MPO supports the transitioning away from foreign fossil fuel reliance, encouraging the research and usage of alternate fuels and power sources. The benefits of alternative energies include improving air quality by reducing the amount of greenhouse gases and air pollutants emitted by automobiles using traditional petroleum based fuels, reducing America’s dependence on foreign oil, and increasing energy sustainability.

Encourage the use of Renewable Energy

Promote the use of renewable energies throughout the Commonwealth, such as solar and wind. Using these sources in place of fossil fuels and nuclear energy reduces the depletion of natural resources and the creation of both toxic and non-toxic wastes.

Encourage coordination between municipalities, federal, state, and regional agencies

Coordination between all interested parties is important to reduce the negative impacts to the environment. Improving air, land, water, and wildlife quality begins with a team approach and is successful with all voices recognized.

Support “Intermodalism.”

Promote using “intermodalism” to better integrate all transportation modes such as: Automobile, Motorcycle, Transit, Rail, Bus, Water, Air, Walking, and Bicycling. Providing a hub that supports all transportation modes attracts more people and increases efficiency.

8.8.2 Air Quality Recommendations

Work towards Reducing GHG Emissions in the Transportation Sector

Prioritize and program an appropriate balance of roadway, transit, bicycle, and pedestrian investments to reduce GHG emissions in the transportation sector.

Strive to reduce single occupancy vehicle travel

Support regulations, such as the Massachusetts Rideshare Regulation, and programs that require or encourage facilities to implement incentives to reduce drive alone commuter trips. Examples of these incentives include flexible working schedules, preferential parking for ridesharing, and on-site provision of transit passes. MassRIDES program offers employers and their employees’ benefits of carpooling and ridesharing.

Encourage the use of non-motorized transportation mode choices

Encourage and support non-polluting modes of transportation, such as bicycling and walking as described in the Bicycle and Pedestrian component of this Plan.

Encourage the formation of Transportation Management Associations (TMAs)

Transportation Management Associations (TMAs) are private, non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, mall, medical center or industrial park. MassRIDES offers carpooling, vanpooling, parking management, and other techniques allow employees to diversify their trips to and from work, thereby reducing congestion and improving air quality.

Encourage the proper design and use of High Occupancy Vehicle (HOV) lanes

High Occupancy Vehicle lanes should be designed for and only used by buses carrying large amounts of people to and from their destinations. These lanes would make commuter bus lines a more acceptable alternative to individuals who drive automobiles, thereby reducing congestion and improving air quality.

Encourage the use of Intelligent Transportation Systems (ITS)

The Old Colony MPO advocates the consideration of ITS solutions for transportation problems as a routine part of the transportation planning process, with the goals of increasing operation efficiency and capacity, improving safety, reducing environmental costs, and enhancing personal mobility.

Promote the increase and enforcement of Corporate Average Fuel Economy (CAFE) Standards for passenger car and light truck fleets

Automobile manufacturers should be required to meet and exceed CAFE standards for passenger and light truck fleets and should be recognized for doing so.

8.8.3 Environmental Justice Recommendations

Ensure that environmental burdens are not disproportionately impacting environmental justice communities.

8.8.4 Water and Natural Resources Protection Recommendations

Collaborate with Municipalities to Promote and Implement Stormwater Management Strategies

Assist municipalities in the development and implementation of local stormwater management programs consistent with EPA Phase II requirements. Help municipalities to explore and establish dedicated revenue source(s) for future SWMP development and implementation, such as a “stormwater utility”. Provide technical assistance to municipalities to inventory, map, and prioritize future remediation of stormwater “choke-points” and localized flooding hotspots.

Minimize the use of Road Salt and Sand

Minimizing the amount of road sand and salt used during the winter months would benefit the environment as the use of road salt damages roads, vehicles and our environment. More often than not, salt washes into streams and rivers, killing plant and animal life alike, or it percolates through the soil into our drinking water supplies. Accumulated amounts of sand can also be hazardous to the natural environment and the travelling public. Minimizing road sand and salt will also help save money, as the price of salt can fluctuate greatly.

8.8.5 Planning for Climate Change Recommendations

Continue Climate Change Adaptation Planning

Continue to include climate change adaptation planning in all transportation related studies. This including identifying areas most vulnerable to climate change as well as what transportation infrastructure is most at risk.

Protect and strengthen transportation systems vulnerable to climate change through identification of at-risk transportation assets and development of protection measures for each category of asset.

9 TRANSPORTATION SAFETY AND SECURITY

Traveling safety is one of the public’s highest expectations from the transportation system. Ongoing coordination among all agencies is necessary to cover the many factors related to maintaining and improving safety, such as, drive skill level, driver impairment, the use of safety equipment, vehicle condition, and road and weather conditions. Incorporating safety into transportation planning often means integrating safety into all aspects of an agency’s operations.

9.1 Issues Challenging Regional Transportation Safety and Security

While municipalities and agencies across the region have made strides in improving transportation safety and security over the past decade, the region continues to face issues and challenges, including:

Several areas on the highway network have been identified as having elevated crash rates and Equivalent Property Damage Only (EPDO) values. The Old Colony Safety Management System primarily uses two products for identifying areas of safety concern among motorists, pedestrians, and bicyclists: the Old Colony Top 100 Most Hazardous Intersections inventory, which ranks safety at intersections based on Equivalent Property Damage Only (EPDO) methodology, and the MassDOT Top Five Percent crash clusters, which is a GIS-based application that plots locations of reported crashes and identifies clusters where crashes are occurring in particularly high volumes. Several locations in the region have either a high EPDO value or appear in the Top 5% crash cluster inventory.

Areas of the region are vulnerable to threats from climate change and other factors. The geographic nature of the region makes it vulnerable to extreme weather threats and areas of the transportation network are particularly vulnerable.

The Safe Routes to School Program is underutilized in the Region. The Safe Routes to School program (SRTS) aims to reduce congestion, air pollution, and traffic congestion near participating schools, while increasing the health, safety, and physical activity of elementary and middle school students. Currently, 70% of eligible partner schools are partner schools.

There continues to be opportunity for increased security at transportation facilities. Safety and security on transit facilities, including park-and-ride lots that serve commuter rail and intercity bus service, can be improved to provide a greater sense of security and comfort to the transit using public.

9.2 MAP-21 and HSIP Legislation

The Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted into law in July 2012, continued the Highway Safety Improvement Program (HSIP) from the previous SAFETEA-LU transportation bill. The HSIP program was continued to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. The HSIP program requires a data driven,

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strategic approach to improving highway safety on all public roads that focuses on performance.

The primary features of the Highway Safety Improvement Program as it was introduced in SAFETEA-LU were retained in the MAP-21 legislation. Specifically, HSIP continued the requirement for states to have a comprehensive, data-driven Strategic Highway Safety Plan (SHSP) that defines state safety goals and describes a program of strategies to reduce identified safety problems. Evaluation of the SHSP is required on a regular basis.

The Highway Safety Improvement Program provides a funding source for any strategy, activity, or project on a public road that is consistent with the Strategic Highway Safety Plan and corrects or improves a hazardous road location or feature, or addresses a highway safety problem.

9.3 Massachusetts Strategic Highway Safety Plan

In 2006, the Massachusetts Department of Transportation (formerly Executive Office of Transportation) presented the Massachusetts Strategic Highway Safety Plan (SHSP), a statewide comprehensive safety plan that provided a coordinated framework for reducing fatalities and serious injuries on the State’s surface transportation network. Through a comprehensive, data driven systematic approach, MassDOT with its state, regional, and local partners targeted six emphasis areas and achieved significant accomplishments in traffic safety and reductions in fatalities and serious injuries.

In 2013, MassDOT released an update to its Strategic Highway Safety Plan. The update built upon the success of the 2006 Plan, and identified fifteen emphasis areas to focus transportation planning and engineering efforts on to improve safety on the transportation system. The emphasis areas were organized into three categories: Strategic, Proactive, and Emerging.

- **Strategic Emphasis Areas:** A strategic emphasis area is one that represents at least 10 percent of fatalities and serious injuries on Massachusetts roadways. There are nine emphasis areas in this tier: Impaired Driving, Intersections, Lane Departures, Occupant Protection, Speeding and Aggressive Driving, Young Drivers, Older Drivers, Pedestrians, and Motorcycles.
- **Proactive Emphasis Areas:** A proactive emphasis area is one that represents less than 10 percent of annual fatalities and serious injuries. There are four emphasis areas in this tier: Bicycles, Truck and Bus Involved Crashes, At-Grade Crossings, and Safety of Persons Working on Roadways.
- **Emerging Emphasis Areas:** An emerging emphasis area is one that focuses on continuously improving the data systems used to analyze traffic safety patterns and generate data on safety topics where data are currently inconclusive. These emphasis areas include Data Systems and Driver Inattention.

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The Strategic Highway Safety Plan identifies specific objectives and performance measures in each emphasis area, and is consistent with the Moving Ahead for Progress in the 21st Century Act (MAP-21). The Old Colony Metropolitan Planning Organization works directly with the Massachusetts Department of Transportation and our partners on achieving goals identified in the SHSP. While some areas such as Impaired Driving, Young Drivers and Occupant Protection involve primarily higher-level efforts such as educational, legislative, and enforcement strategies, the Metropolitan Planning Organization can have a direct effect on other emphasis areas such as Intersections, Lane Departure, and Pedestrians through its planning efforts.

9.4 Safety Management System

The Old Colony Safety Management System consists of a systematic process that has the goal of reducing the number of and severity of traffic crashes on public roads. Recommended actions include providing information for selecting and implementing effective safety strategies and projects. All opportunities to improve roadway safety are identified, considered, and implemented in all phases of highway planning, design, construction, maintenance, and operation.

Guidance from MAP-21 and HSIP legislation, the Federal Highway Administration’s Safety Program and the Massachusetts Strategic Highway Safety Plan (SHSP) have been incorporated into the Old Colony Safety Management System. Based on federal guidance, the Old Colony Safety Management System has been modeled to be a data driven, collaborative process that includes consultation with transportation safety stakeholders on addressing safety planning for highway, transit, bicycle, and pedestrian transportation. This collaborative process includes continually evaluating Engineering components, Education initiatives, Enforcement policies and practices, and Emergency Response (known as the “4 E’s”).

The Massachusetts Strategic Highway Safety Plan is regularly consulted and incorporated into the Old Colony Safety Management System and safety planning processes. The six main emphasis areas: Data Systems; Infrastructure; At-Risk Driver Behavior; Higher Risk Transportation System Users; Public Education and Media; and Safety Program Management are addressed in transportation safety activities.

The safety management system incorporates roadway, human, and vehicle safety elements. Considered an ongoing effort, Old Colony staff collects and maintains all data needed in the estimation of refined performance measures. Staff identifies both existing and future needs of the region’s transportation system with regard to safety. This includes development of annual regional listings of high hazard intersections and corridors, and participation in the Highway Safety Improvement Program.

9.5 Highway Safety

Table 9-1 summarizes crash data for the sixteen communities of the Old Colony region. MassDOT crash data contains over 20,000 records of crashes occurring in the Old Colony region from 2010 through 2012. Of these crashes, about one-third of them involved injuries, while 67

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(less than 1%) were fatal. Brockton had the highest rate of crashes in the region, with 23.33 crashes per roadway mile over the three year period. Kingston had the lowest frequency of crashes with 1.81 crashes per roadway mile. Note that these figures are per roadway mile (according to the MassDOT 2012 Road Inventory Year End Report), and not per vehicle miles traveled, therefore they are heavily skewed by traffic volumes in the community.

Table 9-1: Crashes by Community, 2010-2012

	Roadway Mileage	Total Crashes		With Injuries		Fatal Crashes	Pedestrian			Bicycle		
		Crashes	Per Mile	Crashes	% Total		Crashes	w/Injury	Fatal	Crashes	w/Injury	Fatal
Abington	67.05	1,323	19.73	303	22.90%	5	19	14	2	14	8	0
Avon	33.61	569	16.93	224	39.37%	4	12	5	1	5	2	0
Bridgewater	134.16	1,422	10.60	369	25.95%	3	11	10	0	8	4	1
Brockton	284.23	6,602	23.23	2695	40.82%	12	246	195	3	87	62	1
Duxbury	286.84	539	1.88	183	33.95%	1	3	1	0	1	0	0
East Bridgewater	79.63	793	9.96	264	33.29%	3	13	12	1	6	5	0
Easton	131	1,070	8.17	333	31.12%	4	15	11	0	6	5	0
Halifax	58.97	237	4.02	85	35.86%	1	2	2	0	3	3	0
Hanson	65.92	438	6.64	86	19.63%	5	2	1	0	3	1	0
Kingston	106.67	193	1.81	57	29.53%	3	1	1	0	0	0	0
Pembroke	113.76	920	8.09	251	27.28%	3	5	4	0	6	4	0
Plymouth	506.45	2,450	4.84	785	32.04%	9	24	11	0	13	6	1
Plympton	35.55	104	2.93	30	28.85%	0	0	0	0	0	0	0
Stoughton	123.06	1,994	16.20	479	24.02%	9	29	21	3	25	18	0
West Bridgewater	58.87	910	15.46	277	30.44%	3	6	4	0	1	1	1
Whitman	54.06	854	15.80	176	20.61%	2	17	13	1	16	14	1
OCP Region	2139.83	20,418	9.54	6597	32.31%	67	405	305	11	194	133	5

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Table 9-2: Historical Roadway Safety Performance by Community, 2008-2012

	2008			2009			2010			2011			2012		
	Crashes	w/ Injury	w/ Fatal	Crashes	w/ Injury	w/ Fatal	Crashes	w/ Injury	w/ Fatal	Crashes	w/ Injury	w/ Fatal	Crashes	w/ Injury	w/ Fatal
Abington	464	129	0	479	121	2	390	91	1	505	111	3	428	101	1
		27.80%	0.00%		25.26%	0.42%		23.33%	0.26%		21.98%	0.59%		23.60%	0.23%
Avon	192	73	0	173	71	0	210	85	2	170	63	1	189	76	1
		38.02%	0.00%		41.04%	0.00%		40.48%	0.95%		37.06%	0.59%		40.21%	0.53%
Bridgewater	470	128	2	448	126	0	492	143	2	480	130	0	450	96	1
		27.23%	0.43%		28.13%	0.00%		29.07%	0.41%		27.08%	0.00%		21.33%	0.22%
Brockton	2,410	967	3	2,118	927	3	2,171	908	2	2,286	931	5	2,145	856	5
		40.12%	0.12%		43.77%	0.14%		41.82%	0.09%		40.73%	0.22%		39.91%	0.23%
Duxbury	208	55	0	76	30	0	189	62	0	181	66	1	169	55	0
		26.44%	0.00%		39.47%	0.00%		32.80%	0.00%		36.46%	0.55%		32.54%	0.00%
East Bridgewater	244	62	0	251	63	0	282	83	2	261	76	0	250	105	1
		25.41%	0.00%		25.10%	0.00%		29.43%	0.71%		29.12%	0.00%		42.00%	0.40%
Easton	444	132	1	363	118	2	369	121	0	344	102	2	357	110	2
		29.73%	0.23%		32.51%	0.55%		32.79%	0.00%		29.65%	0.58%		30.81%	0.56%
Halifax	86	27	3	84	27	2	76	31	0	77	23	0	84	31	1
		31.40%	3.49%		32.14%	2.38%		40.79%	0.00%		29.87%	0.00%		36.90%	1.19%
Hanson	140	32	0	146	22	0	149	35	0	159	25	3	130	26	2
		22.86%	0.00%		15.07%	0.00%		23.49%	0.00%		15.72%	1.89%		20.00%	1.54%
Kingston	323	93	3	150	40	1	75	26	0	29	7	2	89	24	1
		28.79%	0.93%		26.67%	0.67%		34.67%	0.00%		24.14%	6.90%		26.97%	1.12%
Pembroke	339	85	0	311	81	1	319	76	2	291	90	1	310	85	0
		25.07%	0.00%		26.05%	0.32%		23.82%	0.63%		30.93%	0.34%		27.42%	0.00%
Plymouth	1,082	306	5	961	280	4	869	281	3	780	241	5	801	263	1
		28.28%	0.46%		29.14%	0.42%		32.34%	0.35%		30.90%	0.64%		32.83%	0.12%
Plympton	46	13	1	45	12	1	35	8	0	33	11	0	36	11	0
		28.26%	2.17%		26.67%	2.22%		22.86%	0.00%		33.33%	0.00%		30.56%	0.00%
Stoughton	730	177	1	712	193	3	600	151	5	700	180	1	694	148	3
		24.25%	0.14%		27.11%	0.42%		25.17%	0.83%		25.71%	0.14%		21.33%	0.43%
West Bridgewater	317	77	0	78	28	1	316	115	2	300	82	0	294	80	1
		24.29%	0.00%		35.90%	1.28%		36.39%	0.63%		27.33%	0.00%		27.21%	0.34%
Whitman	255	73	2	233	61	1	297	70	1	331	72	0	226	34	1
		28.63%	0.78%		26.18%	0.43%		23.57%	0.34%		21.75%	0.00%		15.04%	0.44%
Region	7,750	2,429	21	6,628	2,200	21	6,839	2,286	22	6,927	2,210	24	6,652	2,101	21
		31.34%	0.27%		33.19%	0.32%		33.43%	0.32%		31.90%	0.35%		31.58%	0.32%

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Figure 9-1: Crashes with Non-Fatal Injuries by Year

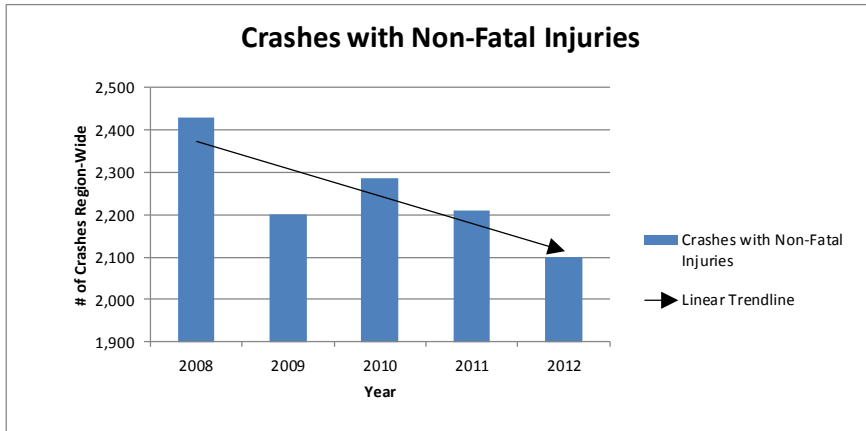


Figure 9-1: An overall decreasing trend in the number of crashes resulting in non-fatal injuries was observed from 2008 through 2012, with a total reduction in crashes with injuries of 13.5% over the 5 year period

Figure 9-2: Crashes with Fatal Injuries by Year

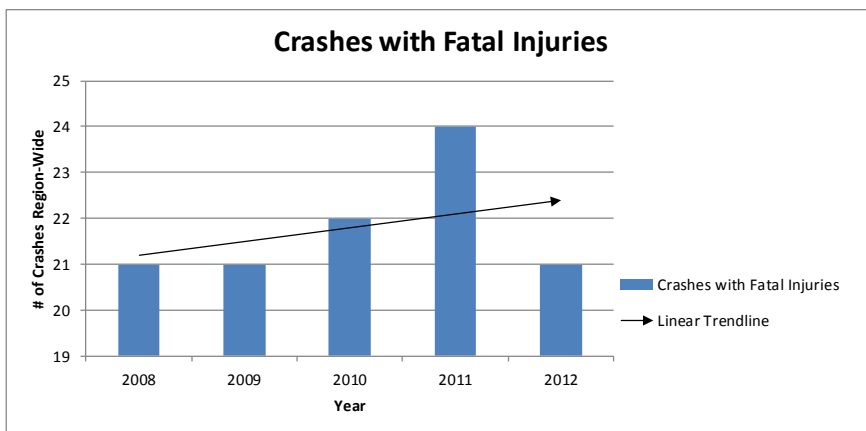


Figure 9-2: The number of fatal crashes per year has remained relatively stable from 2008 through 2012, although a slight increasing trend in the data is detected due to slight increases in 2010 and 2011

9.6 Intersections

In their Strategic Highway Safety Plan, MassDOT has identified intersections as a strategic emphasis area where infrastructure improvements can be implemented to improve highway safety. The MassDOT maintains a database of crashes occurring in Massachusetts based on crash reports submitted to the Massachusetts Registry of Motor Vehicles (RMV). With the data, MassDOT generates analysis tools such as a Geographic Information Systems (GIS) based crash clustering system where crash locations are plotted, and “clusters” where crashes are occurring in close proximity to each other, such as at an intersection or highway interchange, are

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identified. The Top 5% worst crash clusters are used to determine eligibility for improvements funding through the Highway Safety Improvement Program (HSIP). MassDOT also generates a Top 200 Most Hazardous Intersections statewide list, which uses an Equivalent Property Damage Only (EPDO) weighted average methodology. Similarly, the Old Colony Metropolitan Planning Organization generates a Top 100 Most Hazardous Intersections list for the region using the same EPDO weighted average methodology.

The Old Colony Metropolitan Planning Organization has opportunity through its partnerships with federal, state, and local agencies to mitigate crash rates along with the frequency of fatalities and serious injuries through Unified Planning Work Program (UPWP) activities and the Transportation Improvement Program (TIP). The Old Colony Top 100 Most Hazardous Intersections list along with the MassDOT inventory of top crash clusters are among the analysis tools utilized to determine where efforts and investments may be targeted to improve safety at intersections in the region.

Table 9-3 summarizes the top 100 high crash locations in the region based on MassDOT's crash database. This list of hazardous intersections is prioritized by the highest weighted average, utilizing the same weighted methodology used by MassDOT. Table 9-3 is based on the latest available data for the region (years 2010 through 2012).

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Table 9-3 Old Colony Top 100 Most Hazardous Intersections (2010-2012)

Rank	Community	Intersection	EPDO	Crashes 2010-2012				Top 5% Crash Cluster?	MassDOT Top 200?	Notes
				Total Crashes	Fatal Crashes	With Non-Fatal Injuries	Property Damage Only			
1	Brockton	Pleasant St. (Rte. 27) at West St / Reynolds Hwy	312	116	0	49	67	Yes	Yes	Improved 2014
2	Brockton	West Elm St. at Ash St	215	71	0	36	35	Yes	Yes	TIP Project#601644
3	Brockton	West Elm St. at Newbury St.	133	45	0	22	23	Yes		TIP Project#601644
4	Brockton	Main St. at Centre St (Rte. 123) / Legion Pkwy.	131	47	0	21	26	Yes	Yes	RSA Completed 2010
5	Brockton	North Main St. at Howard St. / Oak St	125	49	0	19	30	Yes	Yes	RSA Completed 2011
6	Brockton	Centre St. (Rte. 123) at Quincy St.	123	38	1	19	18	Yes	Yes	
7	Brockton	Warren Ave. at West Elm St	123	39	0	21	18	Yes	Yes	RSA Completed 2012
8	Stoughton	Washington St. (Rte. 138) at Central St.	122	66	0	14	52	Yes		Improvements Under Design (Project#607403)
9	Brockton	Centre St. (Rte. 123) at Plymouth St	121	41	0	20	21	Yes	Yes	
10	Brockton	Reynolds Hwy. (Rte. 27) at Christy's Pl. / Westgate Mall	119	39	0	20	19	Yes	Yes	Improved 2011
11	Brockton	Warren Ave. at Forest Ave.	119	39	0	20	19	Yes	Yes	Studied 2014
12	Brockton	Belmont St. (Rte. 123) at Manley St	119	47	0	18	29	Yes	Yes	Under Construction
13	Brockton	Pleasant St. (Rte. 27) at Ash St. / North Ash St	113	37	0	19	18	Yes	Yes	Improved 2015
14	East Bridgewater	Bedford St. (Rte. 18) at West St. (Rte. 106) / East St	108	48	0	15	33	Yes		Studied 2009
15	Brockton	North Montello St. (Rte. 28) at East Ashland St.	104	36	0	17	19	Yes	Yes	Studied 2005
16	Brockton	North Montello St. (Rte. 28) at Howard St. (Rte. 37)	102	30	0	18	12	Yes		Improved 2006
17	Brockton	Crescent St. (Rte. 27) at Lyman St.	102	34	0	17	17	Yes	Yes	Improvements Under Design
18	Brockton	Montello St. (Rte. 28) at Court St.	102	38	0	16	22	Yes	Yes	Studied 2005
19	Brockton	North Pearl St. at Oak St	99	39	0	15	24	Yes	Yes	Studied 2008
20	Brockton	Belmont St. (Rte. 123) at Linwood St. / Lorraine Ave.	99	43	0	14	29	Yes	Yes	TIP Project#606036
21	Brockton	Crescent St. (Rte. 27) at Montello St. (Rte. 28)	98	30	0	17	13			Studied 2008
22	Whitman	Bedford St. (Rte. 18) at Temple St. (Rte. 27)	98	66	0	8	58	Yes	Yes	Improvements Under Design (Project 607860)
23	Stoughton	Canton St. (Rte. 27) at School St	97	48	1	10	37	Yes	Yes	RSA Completed 2009
24	Abington	Bedford St. (Rte. 18) at Randolph St. / North Ave. (Rte. 139)	96	52	0	11	41	No	Yes	RSA Completed 2011
25	Pembroke	Church St. (Rte. 139) at Union St	95	47	0	12	35	Yes		Studied 2010

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Table 9-3 Old Colony Top 100 Most Hazardous Intersections (2010-2012), Continued

Rank	Community	Intersection	EPDO	Crashes 2010-2012				Top 5% Crash Cluster?	MassDOT Top 200?	Notes
				Total Crashes	Fatal Crashes	With Non-Fatal Injuries	Property Damage Only			
26	Brockton	North Montello St. (Rte. 28) at Livingston Rd.	94	30	0	16	14	Yes	Yes	Studied 2005
27	Brockton	North Main St. at East Ashland St.	93	33	0	15	18	Yes	Yes	
28	Brockton	Pleasant St. (Rte. 27) at North Warren Ave.	92	44	0	12	32	Yes	Yes	Improved 2015
29	Brockton	Oak St. at Belair St.	90	30	0	15	15	Yes	Yes	
30	Brockton	Forest Ave. at Bouve Ave. / Manomet St	89	29	0	15	14	Yes		Studied 2014
31	Brockton	Warren Ave. at Market St	86	22	0	16	6	Yes		
32	Brockton	Belmont St (Rte. 123) at VA Hospital	84	32	0	13	19			Under Construction
33	East Bridgewater	Bedford St (Rte. 18) at Whitman St (Rte. 106)	84	32	0	13	19	Yes		RSA Completed 2014
34	Whitman	Bedford St (Rte. 18) at Auburn St (Rte. 14)	83	51	0	8	43	Yes		Improvements Under Design (Project 607860)
35	Brockton	Centre St (Rte. 123) at Montello St. (Rte. 28)	81	29	0	13	16			Studied 2005
36	Brockton	North Cary St. at East Ashland St.	77	29	0	12	17	Yes		
37	Abington	Plymouth St (Rte. 58) at Centre Ave. (Rte. 123)	77	45	0	8	37			Studied 2010
38	Pembroke	Washington St (Rte. 53) at Columbia Rd. / Schoosett St (Rte. 139)	76	36	0	10	26	Yes		
39	Brockton	Court St. at Cary St / North Cary St. / Provost St.	74	26	0	12	14	Yes		Studied 2010
40	Brockton	North Main St. at Battles St.	73	25	0	12	13	Yes	Yes	
41	Brockton	Main St. at Nilsson St.	72	27	1	9	17	Yes		
42	Brockton	West Elm St. at Belmont Ave.	72	24	0	12	12	Yes		TIP Project #601644
43	Easton	Tumpike St. at Purchase St.	72	28	0	11	17	Yes		
44	Plymouth	Obery St. at South St.	71	27	0	11	16			Improvements Under Design (Project #606264)
45	Stoughton	Central St. at Pearl St.	71	31	0	10	21	Yes		Studied 2013
46	Brockton	Oak St. at Reservoir St.	70	26	0	11	15	Yes		
47	Brockton	Pleasant St. (Rte. 27) at Main St.	70	26	0	11	15	Yes	Yes	Improved 2015
48	Easton	Washington St (Rte. 138) at Purchase St.	69	21	0	12	9	Yes		Studied 2007
49	Stoughton	Washington St (Rte. 138) at Park St (Rte. 27) / Pleasant St (Rte. 139)	69	29	0	10	19	Yes		Studied 2011
50	Stoughton	Central St. (Rte. 27) at Island St.	69	33	0	9	24	Yes		Studied 2014

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Table 9-3 Old Colony Top 100 Most Hazardous Intersections (2010-2012), Continued

Rank	Community	Intersection	EPDO	Crashes 2010-2012				Top 5% Crash Cluster?	MassDOT Top 200?	Notes
				Total Crashes	Fatal Crashes	With Non-Fatal Injuries	Property Damage Only			
51	Brockton	West Elm St. at Moraine St.	68	20	0	12	8	Yes	TIP Project#601644	
52	Brockton	Montello St. (Rte. 28) at East Nilsson St.	68	24	0	11	13	Yes	Studied 2005	
53	Brockton	North Quincy St. at Boundary Ave. / Chestnut St.	68	24	0	11	13	Yes	Improvements Under Design	
54	Easton	Washington St. (Rte. 138) at Belmont St. (Rte. 123)	68	28	0	10	18	Yes	Studied 2007	
55	Abington	Brockton Ave. (Rte. 123) at Rockland St. / Elm St.	68	32	0	9	23			
56	Stoughton	Washington St. (Rte. 138) at School St.	68	32	0	9	23	Yes		
57	Brockton	Pleasant St. (Rte. 27) at Augusta Ave. / Belmont Ave.	67	19	0	12	7	Yes	Improved 2015	
58	Easton	Foundry St. (Rte. 106) at Turnpike St. (Rte. 138)	67	35	0	8	27	Yes	Under Construction	
59	Bridgewater	Broad St. (Rte. 18) at High St.	67	39	0	7	32	Yes	Under Construction	
60	Bridgewater	Central Square at Summer St. / Broad St. / Main St.	67	39	0	7	32	Yes	Studied 2009	
61	West Bridgewater	East/West Centre St. (Route 106) at North/South Main St. (Rte. 28)	67	47	0	5	42	Yes	Under Construction	
62	Stoughton	Pleasant St. (Rte. 139) at Central St.	66	34	0	8	26	Yes	Studied 2013	
63	Brockton	Main St. at Perkins Ave. / South St.	64	28	0	9	19	Yes		
64	Avon	East Main St. (Rte. 28) at East/West Spring St.	63	27	0	9	18	Yes	RSA Completed 2013	
65	Brockton	Oak St. at Campanelli Industrial Dr.	63	27	0	9	18	Yes		
66	Brockton	Belmont St. (Rte. 123) at Pearl St.	63	31	0	8	23			
67	Brockton	North Montello St. (Rte. 28) at Ames St.	62	22	0	10	12	Yes	Studied 2005	
68	Plymouth	Court St. (Rte. 3A) at Samoset St. (Rte. 44)	62	22	0	10	12	Yes	Studied 2007	
69	Bridgewater	Bedford St. (Rte. 18/28) at Grove St.	61	29	0	8	21	Yes	Studied 2005	
70	Brockton	Centre St. (Rte. 123) at Gladstone St. / Sheridan St.	60	16	0	11	5	Yes		
71	Brockton	Belmont St. (Rte. 123) at West St.	60	24	0	9	15	Yes		
72	Brockton	North Montello St. (Rte. 28) at East Battles St.	60	24	0	9	15	Yes	Studied 2005	
73	Brockton	North Main St. at Ames St.	59	19	0	10	9	Yes		
74	Brockton	Oak St. at Battles St.	59	19	0	10	9	Yes		
75	Brockton	Pleasant St. at Pearl St. / North Pearl St.	58	18	0	10	8			

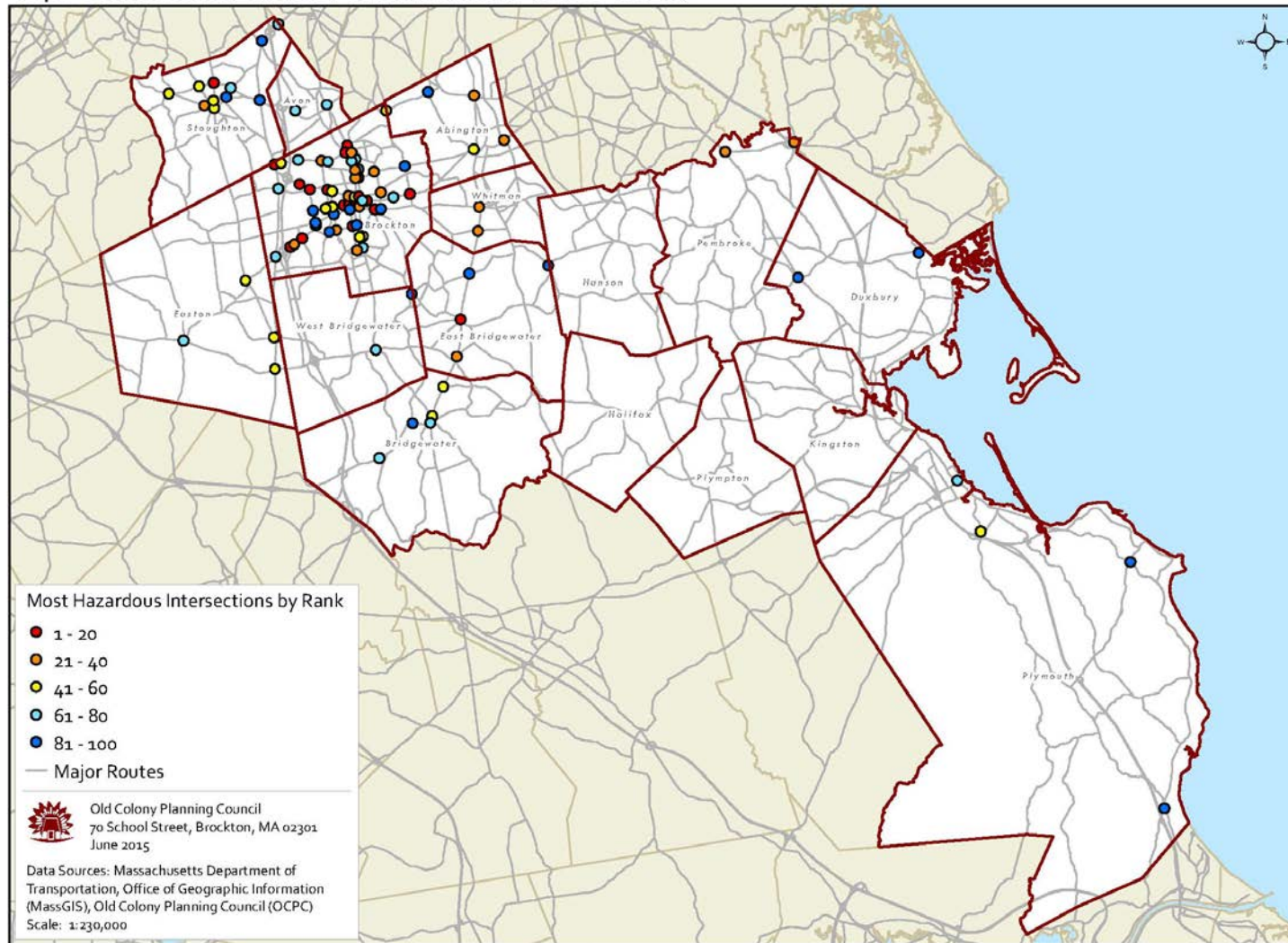
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Table 9-3 Old Colony Top 100 Most Hazardous Intersections (2010-2012), Continued

Rank	Community	Intersection	EPDO	Crashes 2010-2012				Top 5% Crash Cluster?	MassDOT Top 200?	Notes
				Total Crashes	Fatal Crashes	With Non-Fatal Injuries	Property Damage Only			
76	Brockton	Centre St (Rte. 123) at Commercial St.	58	22	0	9	13	Yes		
77	Bridgewater	Pleasant St. (Rte. 104) at Scotland Blvd.	58	34	0	6	28	Yes	Studied 2012	
78	Avon	Harrison Blvd. at Pond St.	57	21	0	9	12	Yes	Studied 2013	
79	Stoughton	Lindelof Ave. (Rte. 139) at Technology Center Dr.	57	21	0	9	12	Yes	Studied 2010	
80	Easton	Foundry St (Rte. 106) at Bay Rd. (Rte. 123)	57	29	0	7	22	Yes	Reconstructed	
81	Brockton	North Quincy St at East Ashland St.	56	20	0	9	11	Yes		
82	Stoughton	Lindelof Ave. (Rte. 139) at Turnpike St. / Hawes Way	56	28	0	7	21	Yes	Studied 2010	
83	Duxbury	Summer St (Rte. 53) at Franklin St.	55	18	1	7	10	Yes		
84	Brockton	Belmont St (Rte. 123) at Belmont Ave. / Manomet St.	55	19	0	9	10	Yes		
85	Stoughton	Pleasant St. (Rte. 139) at Lincoln St.	53	21	0	8	13	Yes	Studied 2010	
86	East Bridgewater	Bedford St (Rte. 18) at Highland St.	53	25	0	7	18	Yes	Studied 2009	
87	Abington	Hancock St at Chestnut St.	52	20	0	8	12	Yes	Studied 2014	
88	Brockton	Main St. at Forest Ave.	52	20	0	8	12	Yes	Studied 2014	
89	East Bridgewater	Washington St (Rte. 14) at Oak St.	52	20	0	8	12	Yes		
90	West Bridgewater	Belmont St. at Plain St.	51	15	0	9	6	Yes		
91	Brockton	Belmont St (Rte. 123) at Warren Ave.	51	23	0	7	16	Yes		
92	Stoughton	Turnpike St. at Central St.	51	27	0	6	21	Yes	Studied 2013	
93	Plymouth	State Rd. (Rte. 3A) at Herring Pond Rd.	50	18	0	8	10		Studied 2007	
94	Brockton	Forest Ave. at Ash St.	50	22	0	7	15	Yes	Studied 2014	
95	Duxbury	Tremont St (Rte. 3A) at Church St. (Rte. 139)	49	17	0	8	9	Yes		
96	Brockton	West St. at Torrey St.	49	25	0	6	19	Yes		
97	Bridgewater	Pleasant St. (Rte. 104) at Center St.	49	29	0	5	24		Studied 2012	
98	Brockton	Crescent St. (Rte. 27) at Wendell Ave. / Crescent Ave.	48	16	0	8	8			
99	Brockton	West St. at West Elm St.	48	16	0	8	8	Yes		
100	Plymouth	State Rd. (Rte. 3A) at Beaver Dam Rd. / White Horse Rd.	48	20	0	7	13		Studied 2007	

Figure 9-3: Locations of Old Colony Top 100 Most Hazardous Intersections

Top 100 Most Hazardous Intersections (2010-2012)



9.7 Transit Safety

The Brockton Area Transit Authority (BAT) and the Massachusetts Bay Transportation Authority (MBTA) maintain programs in their planning and operations to ensure the safety of employees, passengers, and the general public. The Brockton Area Transit Authority continuously monitors safety and security on their system, and routinely reports rates of incidence through their Performance Dashboard.

9.8 Bicycle and Pedestrian Safety

Addressing safety for bicyclists and pedestrians is a key component of an overall focus on safety throughout the region. Pedestrian crashes have been identified as a Strategic Emphasis Area in the Massachusetts Strategic Highway Safety Plan, while bicycle crashes are identified as a Proactive Emphasis Area. The Old Colony Metropolitan Planning Organization has opportunity through its partnerships with federal, state, and local agencies to mitigate crash rates along with the frequency of fatalities and serious injuries through Unified Planning Work Program (UPWP) activities and the Transportation Improvement Program (TIP). Similar to crash clustering of motor vehicle accidents, MassDOT identifies pedestrian and bicycle crash clusters using a GIS-based methodology. The Old Colony MPO is committed to working with state and municipal agencies through its transportation planning tasks to address areas that have been identified as bicycle and pedestrian involved crash clusters.

Bicycle and pedestrian safety education is a critical component of efforts to reduce the number and frequency of bicycle and pedestrian related crashes, and subsequently reducing resulting fatalities and serious injuries. The Massachusetts Safe Routes to School (SRTS) program aims to teach safe pedestrian and bicycling habits to elementary and middle-school aged children while promoting healthy transportation choice for children and parents in their travel to and from school. The children who benefit from the Safe Routes to School program often extend those learned safe habits to family members and friends, extending the societal benefits of the program. In 2014, a formal partnership between the Region and MassRIDES (the statewide administrator of the Safe Routes to School program) was established in an effort to increase partnership and participation by eligible schools (those schools housing grades K-8) in the Old Colony Region. Through joint efforts, partnership in the program has increased yet remains underutilized with 70% of eligible schools partnered with MassRIDES as of May 2015. The Old Colony MPO is committed to continuing its efforts with MassRIDES to further increase partnership and participation by eligible schools.

9.9 Security on the Transportation Network

Securing the transportation system from threats and disruptions is an overarching concern for all transportation providers. According to the Federal Transit Administration, transit security refers to measures taken to protect a recipient's employees and the public against any intentional act or threat of violence or personal harm, either from a criminal or terrorist act. These actions include, but are not limited to, deploying surveillance technology and security personnel along routes and at stations, implementing security training programs for employees and security awareness programs for the public, and conducting inspections of facilities and passengers. Decisions to provide a greater level of security at some but not all of a recipient's fixed guideway stations in its area or along some but not all of a recipient's transit routes should be based on neutral criteria such as an assessment of security threats to facilities, data showing higher levels of criminal activity at certain facilities or in vehicles traveling along certain routes, or objective information that leads officials to believe that certain facilities or routes are more likely to be at risk. Policies associated with observing suspicious activity should ensure that suspicious activity is observed without regard to race, color, or national origin.

Safety and security are concerns that affect everyone within the region. Vukan R Vuchic in *Urban Transit: Operations, Planning, and Economics, 2005* outlines some concerns about safety and security that are applicable to the region. Items to consider in the safe operation of fixed route transit are: Vehicle performance, bus body design and strength, fire prevention and resistance, driver training and performance, conditions along the routes, bus stop design and operations, communication with control center, and the utilization of ITS. Fixed route transit providers keep many of these topics in mind when planning for the safety and security of their operations.

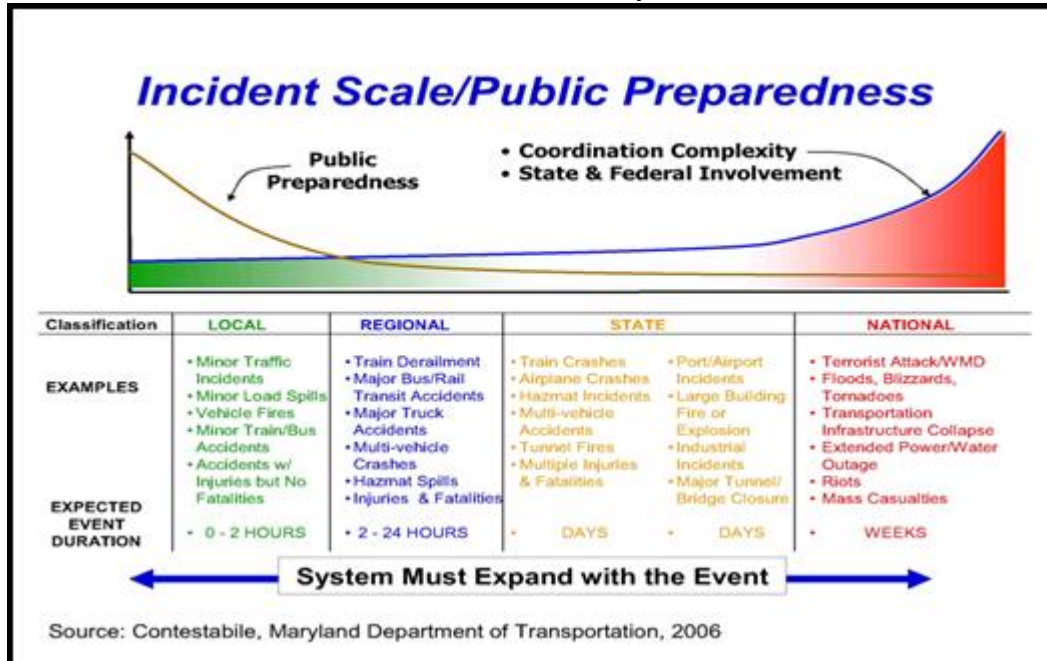
Vuchic also outlines guidelines for security of transit operations, which can be summarized as passenger security, employee security and the protection of revenues, which includes external theft, internal theft and fare evasion. BAT's has a philosophy similar to Vuchic, believing safety and security is to protect employees, passengers, assets, and revenues. BAT carries this philosophy out through various mechanisms such as employee training, participation in emergency and pandemic drills, the development of continuity of operations plans; uniformed and plain-clothes transit patrols, and, the review of trends on complaints and physical damage so they can be informed and up to date on trends in the system.

Figure 9.4 provides an illustration of the relationship between the scale of a security incident and the level of public preparedness and consequent planning and coordination needs. As can be expected, as the scale moves from local to national, public preparedness declines and Coordination Complexity/ State & Federal Involvement increases. Effective coordination and communication among the many different operating agencies in a region and across the nation is absolutely essential. Such coordination is needed to allow enforcement/security/safety responses to occur in an expeditious manner, while at the same time still permitting the transportation system to handle the possibly overwhelming public response to the incident. Complementary to this is the need to make sure the public has clear and concise information

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about the situation and what actions they should take. Although the immediate organizational response to security incidents and disasters will be the responsibility of security/public safety agencies, there is an important role that the Old Colony MPO can play in promoting coordinated planning in anticipation of unexpected events or natural disasters. In addition, it could also provide a centralized location of information on transportation system conditions and local/national responses that might be useful in an emergency.

Figure 9-4
Incident Scale/ Public Preparedness



Source: Maryland Department of Transportation, 2006

9.9.1 Security Planning in the Old Colony Region

Areas that the Old Colony MPO may consider with regard to security planning would be to examine and evaluate its strengths and abilities in technical analysis and transportation planning, and subsequently, the actions and tasks that seem most appropriate for the MPO in the context of security/disaster planning. Examples of tasks that may be suitable for programming in the UPWP are as follows:

- Conducting vulnerability analyses on regional transportation facilities and services
- Analyzing transportation network for redundancies in moving large numbers of people (e.g., modeling person and vehicle flows with major links removed or reversed, accommodating street closures, adaptive signal control strategies, impact of traveler information systems), and strategies for dealing with "choke" points and bottlenecks.

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- Analyzing transportation network for emergency route planning/strategic gaps in the network.

Transit system security is a regional concern. Issues to be addressed in planning for transit security are the age of the system, the types of structures comprising the system, the vulnerability of those structures, the lack of redundant and/or alternate system components and/or capacity, and the increased requirements (over and above personal safety requirements) to provide for anti-terrorism security.

The Secure Stations Initiative is one of the MBTA's programs to enhance its system wide operational security by improving its communications and security systems. This is a requirement of both the Massachusetts State Homeland Security Strategy and the Regional Transit Security Strategy. The Regional Transit Security Strategy was developed by the Regional Transit Security Working Group and is discussed below.

Any new construction, reconstruction, enhancement, or modernization project will include installation or upgrades to the following communications systems:

- closed-circuit television
- public address
- variable message sign
- security intrusion detection
- burglar alarm
- fire alarm
- police call box

One of the issues facing the MBTA in its security emergency response planning is that of interoperability. Interoperability is defined as the ability of radio equipment belonging to one department's emergency first responders to communicate with that of another department's first responders.

9.10 Evacuation Planning

The South Shore and southeastern Massachusetts is vulnerable to both natural and industrial disasters, and planning response and evacuation for such disasters is an important responsibility of local, regional, state, and federal government agencies. Late summer hurricanes, major winter blizzards, and summer droughts are all part of life in Southeastern Massachusetts, but most are at a manageable level. Other threats, e. g, earthquakes, landslides, and major fires are less common or manageable. Hurricanes and blizzards can be very destructive as we know from the Blizzard of 1978, Hurricanes Gloria and Bob, and the blizzard of 2015. Less common events occasionally occur such as Plymouth's 1957 wildfire that burned to the sea; and local fires in Plymouth's Uncle Brances Road and Clark Road areas early in 2005. These events can have disastrous effects on natural features and our synthetic communities. For the sake of waterborne transportation, waterpower, and access to marine resources and level building sites, many older communities have developed on the unprotected coast and along flood plains.

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Hurricanes, floods, tornadoes, and wildfires not only threaten lives and property, but also the transportation system critical for response to such emergencies, and for evacuation. The Old Colony MPO and the Old Colony Planning Council have played a lead role in working with partners on developing pre-disaster mitigation plans, and identifying components of the transportation system most vulnerable to disasters.

The Pilgrim Nuclear Generation Station located on the shore of Plymouth near the Manomet section of Town poses perhaps the greatest potential non-natural hazard in the region. Commissioned in 1972, the Pilgrim Nuclear Power Station features a Boiling Water Reactor, General Electric Mark 1 design, with an output capacity of 685 megawatts. Spent nuclear fuel used by the plant is currently stored on-site, awaiting direction from the Federal government on permanent disposal processes.

Local, regional, state, and federal agencies should coordinate regularly and routinely on planning for response and evacuations in the event of natural and industrial disasters. Plans should recognize and consider all assets of the transportation network, including highway and rail. Physical capital that may be needed in such an event, such as portable variable message signs, portable lighting, barriers and delineators, generators, and vehicles should be inventoried in readily accessible plans and be able to be quickly and easily deployed. Expansion of permanent variable message signs and traffic cameras should be expanded onto the South Shore, including the Routes 3, 24, and 44 corridors. This permanent capital is not only beneficial in emergency response and evacuation, but for everyday congestion management operations and incident management as well.

9.11 Pre-Disaster Mitigation

The Old Colony Planning Council, under contract with the Massachusetts Emergency Management Agency (MEMA) developed a Multi-Hazard Pre-Disaster Mitigation Plan. The purpose of the Multi-Hazard Pre-Disaster Mitigation Plan is to examine the natural hazards facing the Old Colony Region, review present protective features and provisions, assess the remaining vulnerability of the area's residents and critical facilities, and recommend ways to mitigate potential damage before the events occur. The Plan draws on the local knowledge of diverse officials and residents in order to produce practical, feasible recommendations for mitigation development against such natural hazards. Ideally, the recommended actions will help to save lives, protect property, and minimize disruption of essential services.

To guide this effort, the OCPC established a regional Multiple Hazard Community Planning Team drawing on locally appointed officials or their representatives. These included Local Emergency Management Directors, Fire, and Police Departments, Public Works officials, Conservation Officers, and others concerned with emergency management, natural resource management, and protection of life and property. The effort drew heavily on the experience and knowledge of the public safety officials and others on the Multi-Hazard Community Planning Team.

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The Old Colony Metropolitan Planning Organization through the planning staff is committed to continuing to work with local, regional, state, and federal emergency management officials in preparing for major weather events and other emergencies.


9.12 TIP Project Evaluation Criteria

An evaluation process to prioritize transportation projects included in the Transportation Improvement Program (TIP) was implemented several years ago. Among the criteria utilized as part of the effort are safety and security.


9.13 Conclusions, Policies, and Recommendations

While great strides have been taken to improve safety and security throughout the transportation network nationally, statewide, and locally, there must be a continued focus on further reducing crashes, injuries, and fatalities. The Old Colony Metropolitan Planning Organization recommends and is committed to the implementation of the following policies and recommendations to improve safety and security throughout the transportation network.

Target planning efforts and investments at identified high crash locations. Through the Old Colony Safety Management System (and analysis tools such as the Top 100 Most Hazardous Intersections lists and MassDOT Crash Clusters inventory) identify a minimum of three (3) high crash locations per year for targeted study, including but not necessarily limited to Road Safety Audits. High crash locations will include those emphasis areas in the Massachusetts Strategic Highway Safety Plan, including intersections, lane departures, older drivers, pedestrians, and bicycles.


 **Target and Performance Measure:** Conduct Road Safety Audits for a minimum of 3 high crash locations (MassDOT Top 5% Crash Clusters) per year, including minimum of 1 pedestrian/walkability audit and one bicycle audit per year

Fully program minimum HSIP targets each TIP year and seek to program Statewide HSIP funds when available/feasible for priority safety related projects.


 **Target and Performance Measure:** Fully program minimum HSIP targets each TIP year and seek to program Statewide HSIP funds when available/feasible for priority safety related projects


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Reduce the rates of motor vehicle, bicycle, and pedestrian fatalities by incorporating engineering, enforcement, education, and emergency response into the planning process. Planning products of the Old Colony Metropolitan Planning Organization will seek to recommended best planning and engineering practices and standards when addressing safety on the transportation system. Staff will continue to work with state and local partners on addressing vehicular, transit, pedestrian, and bicycle safety through planning, legislative, and law enforcement efforts.

 **Target and Performance Measure:** Reduce motor vehicle, pedestrian, and bicyclist fatalities, hospitalizations, and crashes by 10 percent in 10 years

Support the increase and improvement of safety of services, vehicles, and facilities for transit, and for the transportation disadvantaged. Staff will continue to work with Brockton Area Transit Authority (BAT) and other transit providers in the area, while the Old Colony Metropolitan Planning Organization through Old Colony Planning Council will provide planning, technical, and operational assistance to transit providers in the common goal of providing and maintain safe service.

 **Target and Performance Measure:** Maintain fixed route service preventable accidents/ 100k miles below 2 (FY 2014 actual is 1.02) (from BAT Performance Dashboard)


 **Target and Performance Measure:** Maintain demand response service preventable accidents/ 100k miles below 2 (FY 2014 actual is 1.20) (from BAT Performance Dashboard)

Support the implementation of emergency response and evacuation plans in cooperation with emergency management agencies. Emergency response and evacuation needs will be considered in all applicable planning efforts. Staff will work with stakeholders at the statewide, regional, and municipal levels to ensure the transportation network is able to accommodate response, evacuation, and recovery during regional emergencies. Furthermore, staff is committed to the following steps to prepare for emergencies and protect the viability of the transportation network:

- Support the forum for cooperation between the different transportation agencies in the state on security concerns through the Regional Homeland Security Councils.
- Conduct vulnerability analyses on regional transportation facilities and services
- Analyze the transportation network for redundancies in moving large numbers of people (e.g., modeling person and vehicle flows with major links removed or reversed, accommodating street closures, adaptive signal control strategies, impact of traveler information systems), and strategies for dealing with "choke" points and bottlenecks.
- Analyze the transportation network for emergency route planning/strategic gaps in the network
- Incorporate intelligent transportation systems, such as variable message signs, into the emergency response system.

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Increase partnership and participation by elementary and middle schools in the Safe Routes to School Program. The Safe Routes to School program is a valuable asset for teaching safe walking and bicycling habits while *promoting healthy transportation choice for children and parents in their travel to and from school*. Staff will continue its partnership with MassDOT to provide technical support for Safe Routes to School and expand participation to local schools in the Old Colony Region

 **Target and Performance Measure:** Increase percentage of SRTS Partner Schools to 85% in 10 years. Currently, 70% of eligible partner schools are partner schools

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Federal Moving Ahead for Progress in the 21st Century (MAP-21) regulations requires that the Regional Transportation Plan include a financial component that demonstrates how the projects and improvements it identifies can be implemented while achieving financial constraint. The statutory language directs that the Plan be financially constrained to reasonably expected revenues. In addition, this chapter includes a description of federal and state funding programs, and highway and transit financing.

Historical data on transportation spending and allocation within the region are key indicators of potential future spending levels. It is assumed that federal and state funding commitments will continue beyond the life of MAP-21 with future federal legislation and state legislation.

Regardless of the available funding during the implementation of the 2040 Regional Transportation Plan, several pressing issues continue to face the region. They are as follows:

- The infrastructure preservation, maintenance, safety, security, and reliability needs of the regional highway, bridge, and transit network continue to strain available funding. Such strain does not afford investment in regionally significant capacity enhancement and mobility projects.
- The percentage of the federal aid eligible pavement network categorized as in a state of good repair (pavement condition identified as excellent or good by the pavement management system), is declining.
- Extended transit service hours of operation, along with extensive and expanded system reach and coverage cannot be implemented in their entirety given existing funding levels.
- Evolving demographics, and continued growths of population, employment, and households will continue to stress the existing transportation systems and the access to essential services. Examples include the continued increase of medical transportation needs of the aging population.

10.1 Historical Spending Trends

Estimating the amount of funds available in the future is an inexact science at best. One approach is to chart past funding experience and attempt to discern a trend. This trend could then be extrapolated to future years.

The potential issue with such an approach is that funding levels are not as constant as we would like. The amount of funding available changed dramatically between 1991 and 1992 when ISTEA replaced its predecessor, the Surface Transportation and Uniform Relocation Assistance Act (STURAA). While there is no certain reason to think that similar changes in

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funding are likely at the end of the MAP-21 period, that change illustrates the variability of the system and the tentativeness of any long term financial projections.

In addition to uncertainties at the federal level, the future amount of funding that will be available from the state for transportation is indeterminate. State dollars for transportation come from the sources such as: gasoline tax, license/registration fees; bond proceeds, sales tax; tolls; fares; annual appropriation; and local assessment.

Table 10-1 summarizes both federal and non-federal construction spending, in constant dollars, in the Old Colony Region, from 1992 to 2015. The historical data illustrate that a total of approximately \$307.6 million dollars was spent in the twenty three year period averaging approximately \$12.8 million dollars annually.

Table 10-1: Summary of Construction Spending in the Old Colony Region

Year	Sum of Advertised Project Amounts
1992	\$ 20,246,117
1993	\$ 39,417,562
1994	\$ 10,045,153
1995	\$ 29,362,750
1996	\$ 15,738,263
1997	\$ 36,942,432
1998	\$ 8,594,745
1999	\$ 1,869,334
2000	\$ 1,800,000
2001	\$ 3,358,460
2002	\$ 7,225,538
2003	\$ 4,276,801
2004	\$ 5,712,046
2005	\$ 9,971,410
2006	\$ 10,967,000
2007	\$ 7,376,314
2008	\$ 19,080,186
2009	\$ 20,650,414
2010	\$ 7,418,228
2011	\$ 10,462,870
2012	\$ 6,448,368
2013	\$ 10,845,758
2014	\$ 8,492,716
2015	\$ 11,310,972
Total	
\$ 307,613,437	
Annual Average	
\$ 12,817,227	

**Dollars expressed in constant dollar amounts*

10.2 Transportation Funding Programs

The transportation network is financed through federal and state revenue sources. These sources are described below.

10.2.1 Federal Funding

Massachusetts receives transportation funds from the federal government. The major sources are the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and the Federal Aviation Administration (FAA). The United States Congress authorizes funding for these transportation projects through federal legislation. For highways and mass transportation, the most recent authorization was MAP-21. Federal funding received from MAP-21 is allocated to different funding programs.

Highway Funding Programs

National Highway Performance Program (NHPP) provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

Surface Transportation Program (STP) provides funds for roads (including NHS) that are not functionally classified as local or rural minor collectors. These roads are collectively referred to as federal-aid eligible roads. Bridge projects funded with STP funds are not restricted to federal-aid roads but may be on any public road. Transit capital projects are also eligible under this program.

Congestion Mitigation and Air Quality Improvement Program (CMAQ) directs funds toward transportation projects in Clean Air Act non-attainment areas for ozone and carbon monoxide. These projects will contribute to meeting the attainment of national ambient air quality standards. The state receives funds based on its share of the population of air quality non-attainment areas weighted by degree of air pollution.

Highway Safety Improvement Program (HSIP) is a program that aims to reduce the number of fatal and injury crashes by targeting high crash locations. Projects, using (HSIP) funding, are required, by MAP-21, the Federal Legislation, to be selected based a data driven process.

Transportation Alternatives Program (TAP) MAP-21 established a new program to provide for a variety of alternative transportation projects, including many that were previously eligible activities under separately funded programs. The TAP replaces the funding from pre-MAP-21 programs including Transportation Enhancements, Recreational Trails, Safe Routes to School, and several other discretionary programs, wrapping them into a single funding source.

Bridge Replacement and Rehabilitation Program provides funds for rehabilitation and replacement of any bridge on a public road. Bridges on the federal-aid system or off the federal-aid system are eligible for these funds. Eligible activities/ projects are bridge painting, seismic retrofitting, and calcium magnesium applications.

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Other Federal Aid includes projects that received federal funding outside the federal-aid program. Funds in this category are generally approved as line items appended to various pieces of federal legislation. Projects in this category are generally intended to improve public safety within a specified region that might not qualify for funding through other sources.

Non-Federal Aid (NFA) contains all projects not receiving federal funds. Various categories of state funding are included in this group such as bikeways, State Aid (Chapter 90), MassWorks, highway construction, and maintenance.

Transit Funding Programs

49 U.S.C. Section 5307 provides capital, preventative maintenance, and operating assistance to transit systems in urbanized areas. MAP-21 expands eligibility for using Urbanized Area Formula funds for operating expenses. Previously, only urbanized areas with populations below 200,000 were eligible to use Federal transit funding for operating expenses. Now, transit systems in urbanized areas over 200,000 can use their formula funding for operating expenses if they operate no more than 100 buses. Activities eligible under the former Job Access and Reverse Commute (JARC) program, which focused on providing services to low-income individuals to access jobs, are now eligible under the Urbanized Area Formula program.

49 U.S.C. Section 5310 provides formula funding to increase the mobility of seniors and persons with disabilities. Funds are apportioned based on each State's share of the targeted populations and are now apportioned to both States (for all areas under 200,000) and large urbanized areas (over 200,000). The former New Freedom program (5317) is folded into this program.

49 U.S.C. Section 5311 provides capital, planning, and operating assistance to support public transportation in rural areas, defined as areas with fewer than 50,000 residents. Funding is based on a formula that uses land area, population, and transit service.

49 U.S.C. Section 5339 replaces the previous Section 5309 discretionary Bus and Bus Facilities program. This capital program provides funding to replace, rehabilitate, and purchase buses and related equipment, and to construct bus-related facilities.

Mobility Assistance Program (MAP) is a state funded program similar to Section 5310, but provides capital assistance to public non-profit service carriers. MAP funds are intended for use by public agencies, such as Councils on Aging, South Shore Community Action Council, and the Brockton Area Transit Authority (BAT), to provide van service to elderly and individuals with disabilities.

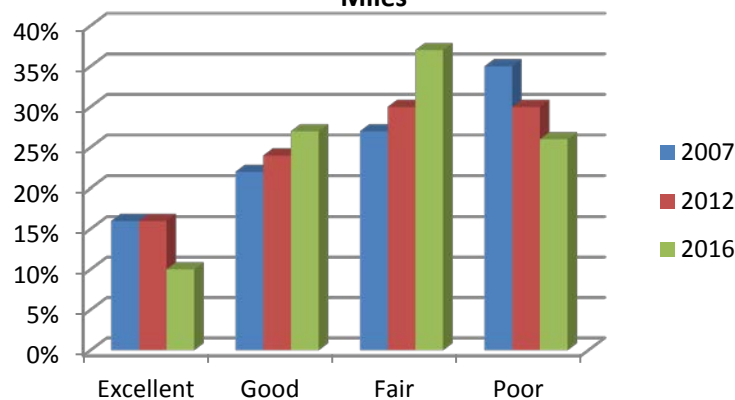
10.3 Management & Operations Considerations

10.3.1 System Level Estimate of Needs and Cost for Maintaining and Operating the Highway System

Given the limited funding, competing priorities, and the comprehensive list of transportation needs, it is crucial to maintain and operate the current system at optimal efficiency, in a safe manner, and in a state of good repair. Also, various management and operation methodologies such as ITS, Transportation Demand Management strategies, Park and Ride Lots, Transit Signal Priority, and Corridor Management strategies such as traffic signal coordination will help the region obtain its goals of improving mobility, improving safety, reducing greenhouse gases, improving sustainability, and promoting economic development.

As such in order to develop a system level estimate of needs and cost for maintaining and operating the highway system, the Old Colony MPO has refined and updated its pavement management system (PMS) in keeping with the principles of objectives-driven, performance-based planning, and in fulfilling its goal of keeping the highway system in a state of good repair. A well-maintained system in good repair reduces delays (due to long reconstruction periods), enhances freight movement, improves economic vitality, and provides opportunities to implement Complete Streets strategies (improving the sidewalk and bicycle facilities network). The PMS calculates the rate of deterioration of pavement and the implications for the cost of repairs. It calculates a Pavement Condition Index (PCI) score between 0 and 100 for the surveyed road segments and recommends a repair and cost based on the PCI score. Each road or road segment is placed in a condition category based on the PCI, which includes “Poor” (PCI = 0 to 64), “Fair” (PCI = 65 to 84), “Good” (PCI = 85 to 94), and “Excellent” (PCI = 95 to 100).

Figure 10-1: Condition Categories Percentage of Miles



The Old Colony MPO updates field inspections of the pavement surface every four years and supplements the data on an ongoing basis, as pavement reconstruction and resurfacing projects are completed on federal aid roads through the Old Colony Transportation

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Improvement Program (TIP). The repairs recommended by the PMS, based on the road condition, include five general default repair strategies.

The total federal-aid road mileage in the region included in Old Colony’s PMS has increased to a total of 642 miles with the recent addition of Duxbury as an Old Colony member community. Figure 5-4 summarizes the percentage of the federal aid mileage in each of the condition categories for the 2016 Old Colony RTP and for previous RTPs in 2012 and 2007. Figure 5-4 shows that in the previous 2012 RTP, 16 percent of the federal aid roads were in the “Excellent” category, 24 percent in the “Good” category, 30 percent were in the “Fair” category, and 30 percent were in the “Poor” category. In the 2007 RTP, 16 percent of the federal aid roads were in the “Excellent” category, 22 percent were in the “Good” category, 27 percent were in the “Fair” category, 35 percent were in the “Poor” category. The condition survey results from the 2014 pavement data survey show that although there are less roads in the “Poor” category, more of the federal aid roads have slipped into the “Good” and “Fair” categories (27 percent and 37 percent compared to the previous 24 percent and 30 percent). Old Colony has set a goal to achieve 50% of federal-aid eligible roadways with PCI-based pavement ranking of "Excellent" or "Good" within 10 years. The total cost in improving all federal aid roads to a state of good repair is estimated by the PMS at \$213,891,765. The overall average PCI for all federal-aid roads is 77.

10.4 Highway Funded Projects and Initiatives

10.4.1 Projected Revenue

The major source of funding for highway related projects is apportionments provided through the Federal Highway Administration (FHWA). These funds typically provide 80% of project funds, with the remaining 20% coming from a state match. Federal funds are usually derived from gasoline tax revenues, and state funds from the Transportation Bond Bill which is funded with gasoline tax revenues and general tax funds.

The MassDOT Office of Transportation Planning has developed funding estimates for the 24 years of the Regional Transportation Plan. To supplement these estimates, reasonable estimates of Chapter 90 Allocations were have been added to the MassDOT funding forecasts. Table 10-2 shows that based on that assumption and MassDOT’s projections, the region can expect to receive approximately \$901,394,856 million for highway and bridges between FFY 2016 and FFY 2040. An estimated \$274,546,740 in Chapter 90 Funding is added to this estimate to arrive a grand total estimate of \$1,175,941,596. Furthermore, the estimated transit funding is \$667,660,868 for transit operations and capital investments as documented in Table 10-7.

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Table 10-2: 2016-2040 Estimated Highway and Bridge Funding

	2016 to 2020	2021 to 2025	2026 to 2030	2031 to 2035	2036 to 2040	TOTAL
Statewide Interstate Maintenance	\$ 1,089,136	\$ 1,030,816	\$ 1,288,111	\$ 1,458,562	\$ 1,571,287	\$ 6,437,912
Statewide National Highway System	\$ 10,555,012	\$ 10,222,402	\$ 12,773,955	\$ 14,464,285	\$ 15,582,143	\$ 63,597,797
Statewide Bridge	\$ 22,862,626	\$ 22,142,178	\$ 27,668,956	\$ 31,330,284	\$ 33,751,614	\$ 137,755,658
Statewide Infrastructure	\$ 1,779,673	\$ 1,723,592	\$ 2,153,807	\$ 2,438,813	\$ 2,627,293	\$ 10,723,178
Other (Remaining) Statewide Programs	\$ 40,509,017	\$ 42,809,034	\$ 53,494,344	\$ 60,573,049	\$ 65,254,376	\$ 262,639,820
Non-Federal Aid Preservation (Bridges and Roads)	\$ 22,797,500	\$ 23,139,463	\$ 23,481,425	\$ 23,823,388	\$ 24,165,349	\$ 117,407,125
Regional Discretionary Funding	\$ 46,865,961	\$ 49,330,022	\$ 61,642,997	\$ 69,799,982	\$ 75,194,404	\$ 302,833,366
Chapter 90	\$ 48,215,965	\$ 50,429,569	\$ 54,326,968	\$ 58,525,574	\$ 63,048,664	\$ 274,546,740
Total Highway and Bridge Available for Programming	\$ 194,674,890	\$ 200,827,076	\$ 236,830,563	\$ 262,413,937	\$ 281,195,130	\$ 1,175,941,596

The funding estimates from the MassDOT Office of Transportation Planning are based on the following assumptions: Federal and state matching funding (core programs plus High Priority Project amounts) for the period of 2016-2020 reflect current allocations and are inflated one and half percent per year thereafter, beginning in 2021.

- Consistent with FHWA Statewide Transportation Improvement Program (STIP) guidance, \$50 million in redistributed obligation authority is assumed each year.
- Federal funding (Obligation authority and redistribution for unspent federal funds) and state match for the period of 2016 – 2020 reflect current Statewide Transportation Improvement Program allocations and funding.
- Beginning in 2021 and each year thereafter, funding is assumed to grow at a rate of 1.5% per year.
- Deductions for statewide items that cannot be allocated individually to the MPOs - Accelerated Bridge Program Grant Anticipation Notes repayments, Planning, and Extra Work Orders/Cost Adjustments - are taken from total available funding, leaving an amount of available federal funding to be allocated in the regional plans.
- Assumed funding for the National Highway Performance Program/Interstate Maintenance Programs, the Federal Aid Bridge Program, and Infrastructure Maintenance mirrors the assumptions made for federal funding – 2016-2019 reflect Statewide Transportation Improvement Program amounts, and thereafter programs are adjusted by a rate of 1.5% per year.
- The Balance Available for the Statewide Road and Bridge Program is a function of the other assumptions made in the financial plan and represents federal funding after deducting statewide line items and Grant Anticipation Notes repayments. For 2016-2020, this amount reflects the regional targets provided in the Statewide Transportation Improvement Program; from 2016 to 2021 it fluctuates based upon the assumed 1.5% growth in revenue and programs costs, as well as the repayment schedule of the Accelerated Bridge Program Grant Anticipation Notes; in 2022, the

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amount balloons to reflect the end of GANs repayments and thereafter it grows at a rate of 1.5% per year.

- The Non-Federal Aid Program is based upon the existing program and held constant at current amounts for 2016-2020. Beginning in 2021 and thereafter, Non-federal aid funding is adjusted at a rate of 1.5% per year.

The funding available should be allocated to operating, maintaining, and improving the highway-funded transportation system. In addition to road projects, this may include bicycle, pedestrian, transportation alternatives, congestion mitigation and air quality, intelligent transportation systems, or any other program for which federal highway funding is expected to be used.

MAP-21 is not the sole source of funding for transportation projects in the Commonwealth. State funds are also a key component in the financing mix for highway projects. State funds are used to “match” federal dollars to pay for the state share of federally aided projects, to undertake other projects not eligible for federal funding, and to assist cities and towns in maintaining and improving local roadways (Chapter 90 funding).

Local funding has historically been used to help design and engineer highway projects. Many of these costs are reimbursable to the communities with Chapter 90 funds once the project has received final state and federal clearances.

10.4.2 Projected Expenses

The Old Colony region’s transportation system is an essential asset that contributes greatly to the economic well-being of the region as well as to the quality of life for the region’s residents. Updating and modernizing the system and conserving and enhancing existing highway capacity by utilizing resources in the most efficient and effective manner as possible requires a comprehensive approach in identifying specific improvement projects and strategies. The funding available has been allocated to operating, maintaining, and improving the highway, bridge transportation system. The following recommendations address the regions’ needs based on the planning process and continued cooperation on a regional basis including member communities, transportation agencies, and state agencies.

Old Colony’s strategies and projects, as well as its transportation review (MEPA) process, support and advance MassDOT policies and goals as outlined in its statutes, directives, guidelines, and standards. It is the intent of this plan to see that projects are developed and implemented in an equitable and timely manner based upon need, financial constraint, and in conformance with the MassDOT design standards, practices, and directives, as well as with local master plans, comprehensive plans, and consensus based on Old Colony’s public outreach program.

The Universe of Projects outlined in the Appendix was developed as a result of the planning process based on the continued cooperation between Old Colony, the general public, member

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communities, transportation agencies, and state agencies. At its core, it represents the collaborative effort to develop the needs of the Old Colony region.

Tables 10-3 and 10-4 list projects derived from the Universe of Projects that are recommended for implementation in the next ten years. Selection of these projects was based on the FFY 2016-2019 Old Colony Transportation Improvement Program, current design status, and demonstrated community support. Additionally, the result of these projects will help the Region achieve its goals, objectives, and performance targets. Funding for these projects is provided by the Regional Discretionary Funding Category.

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Table 10-3: Recommended Projects FFY 2016-2020

FFY	PROJECT ID#	PROJECT DESCRIPTION	Cost Estimate
2016	608085	AVON - INSTALLATION OF A MEDIAN BARRIER ON HARRISON BOULEVARD	\$460,000
2016	606036	BROCKTON - SIGNAL & INTERSECTION IMPROVEMENTS @ ROUTE 123 (BELMONT STREET)/LINWOOD STREET/LORRAINE AVENUE	\$3,541,396
2016	604957	PEMBROKE - RECONSTRUCTION ON ROUTE 14, FROM THE HANSON T.L. TO ROUTE 53 AC PHASE 2 OF 2	\$2,085,520
2017	607438	EASTON - ROUTE 138 @ UNION STREET SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,044,228
2017	607337	PEMBROKE - ROUTE 53 AT PLEASANT STREET SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,957,841
2017	605038	PLYMOUTH- RECONSTRUCTION OF TAYLOR AVENUE, FROM WHITE HORSE ROAD TO MANOMET POINT ROAD, INCLUDES P-13-010	\$5,310,240
2018	606264	PLYMOUTH - IMPROVEMENTS ON OBERY STREET, FROM SOUTH STREET TO A.A. CARANCI WAY/PLYMOUTH NORTH H.S. DRIVE INTERSECTION	\$4,995,087
2018	606143	BROCKTON- INTERSECTION IMPROVEMENTS @ CRESCENT STREET (ROUTE 27)/QUINCY STREET/MASSASOIT BOULEVARD	\$3,897,438
2019	608143	BROCKTON - NORTH QUINCY STREET, CHESTNUT STREET, AND BOUNDARY AVENUE SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$2,240,448
2019	607217	EASTON - ROUTE 123 (DEPOT STREET) RECONSTRUCTION ON FROM NEWELL CIRCLE TO ROUTE 138	\$7,220,326
2020	607403	STOUGHTON - INTERSECTION IMPROVEMENTS & RELATED WORK AT WASHINGTON STREET (ROUTE 138) & CENTRAL STREET	\$3,494,400
2020	PRE - PRC	PLYMOUTH - WATER STREET RECONSTRUCTION (SOUTH PARK AVENUE TO ROUTE 3A)	\$6,988,800
TOTAL PROGRAMMED (ESTIMATED):			\$43,235,724
TOTAL REGIONAL FUNDING TARGET:			\$46,865,961

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Table 10-4: Recommended Projects FFY 2021-2025

<u>FFY</u>	<u>PROJECT ID#</u>	<u>PROJECT DESCRIPTION</u>	<u>COST ESTIMATE</u>
2021-2025	605693	ABINGTON SAFE ROUTES TO SCHOOL (CENTER SCHOOL)	\$570,286
2021-2025	PRE - PRC	BROCKTON - DOWNTOWN BROCKTON CIRCULATION	\$9,963,183
2021-2025	PRE - PRC	EASTON - ROUTE 138 & ELM STREET INTERSECTION SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,315,932
2021-2025	600380	PEMBROKE - REHABILITATION OF ROUTE 36 FROM ROUTE 27 TO ROUTE 14	\$4,748,004
2021-2025	606002	DUXBURY - SIGNAL INSTALLATION @ ROUTE 3 (NB & SB) RAMPS & ROUTE 3A (TREMONT STREET)	\$3,158,236
2021-2025	PRE - PRC	STOUGHTON - CENTRAL STREET & CANTON STREET (ROUTE 27) SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,315,932
2021-2025	PRE - PRC	STOUGHTON - CANTON STREET (ROUTE 27) & SCHOOL STREET SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$1,315,932
2021-2025	PRE - PRC	BROCKTON - ROUTE 27 - CRESCENT STREET, LYMAN STREET, AND SUMMER STREET INTERSECTION IMPROVEMENTS	\$4,342,575
2021-2025	PRE - PRC	ABINGTON - SIGNAL INSTALLATION AND IMPROVEMENTS @ HANCOCK STREET AND CHESTNUT STREET	\$2,001,290
2021-2025	PRE - PRC	EAST BRIDGEWATER - INTERSECTION IMPROVEMENTS @ BEDFORD STREET (ROUTE 18) AT EAST STREET AND WEST STREET (ROUTE 106)	\$2,001,290
2021-2025	604098	EASTON - ROUTE 138 & TURNPIKE STREET INTERSECTION SIGNALIZATION AND GEOMETRIC IMPROVEMENTS	\$2,001,290
2021-2025	607214	STOUGHTON - RECONSTRUCTION OF TURNPIKE STREET	\$19,212,787
TOTAL PROGRAMMED (ESTIMATED):			\$30,162,374
TOTAL REGIONAL FUNDING TARGET (FORECAST):			\$49,330,022

Beyond 2025, the available Regional Discretionary Funding shall continue to be towards operating, maintaining, and improving the highway, bridge transportation.

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Table 10-5: 2016-2040 Operations and Maintenance, and Major Infrastructure Projects

	2016 to 2020	2021 to 2025	2026 to 2030	2031 to 2035	2036 to 2040	TOTAL
Statewide Interstate Maintenance	\$ 1,089,136	\$ 1,030,816	\$ 1,288,111	\$ 1,458,562	\$ 1,571,287	\$ 6,437,912
Statewide National Highway System	\$ 10,555,012	\$ 10,222,402	\$ 12,773,955	\$ 14,464,285	\$ 15,582,143	\$ 63,597,797
Statewide Bridge	\$ 22,862,626	\$ 22,142,178	\$ 27,668,956	\$ 31,330,284	\$ 33,751,614	\$ 137,755,658
Statewide Infrastructure	\$ 1,779,673	\$ 1,723,592	\$ 2,153,807	\$ 2,438,813	\$ 2,627,293	\$ 10,723,178
Other (Remaining) Statewide Programs	\$ 40,509,017	\$ 42,809,034	\$ 53,494,344	\$ 60,573,049	\$ 65,254,376	\$ 262,639,820
Non-Federal Aid Preservation (Bridges and Roads)	\$ 22,797,500	\$ 23,139,463	\$ 23,481,425	\$ 23,823,388	\$ 24,165,349	\$ 117,407,125
Regional Discretionary Funding						
Recon/Resurf/Rehab (Fed-Aid Roads)	\$ 33,500,000	\$ 36,270,921	\$ 41,435,981	\$ 46,483,751	\$ 49,767,066	\$ 207,457,719
Intersection Improvements/Safety	\$ 3,000,000	\$ 3,114,775	\$ 5,739,593	\$ 6,878,016	\$ 7,269,076	\$ 26,001,460
Traffic Flow and Mobility Improvements	\$ 7,500,000	\$ 7,844,326	\$ 10,450,567	\$ 12,103,661	\$ 13,807,228	\$ 51,705,783
Infrastructure (Signage, Guardrails, Etc.)	\$ 865,961	\$ 500,000	\$ 1,200,000	\$ 1,300,000	\$ 1,481,957	\$ 5,347,918
Transportation Alternatives Program Projects	\$ 2,000,000	\$ 1,600,000	\$ 2,816,856	\$ 3,034,554	\$ 2,869,076	\$ 12,320,486
Ongoing Recon/Resurf/Rehab (Local Roads) Chapter 90	\$ 48,215,965	\$ 50,429,569	\$ 54,326,968	\$ 58,525,574	\$ 63,048,664	\$ 274,546,740
Total Project Expenses	\$ 194,674,890	\$ 200,827,076	\$ 236,830,563	\$ 262,413,936	\$ 281,195,130	\$ 1,175,941,595
Total Available Capital Funding	\$ 194,674,890	\$ 200,827,076	\$ 236,830,563	\$ 262,413,937	\$ 281,195,130	\$ 1,175,941,596

10.4.3 Regionally Significant Illustrative Highway Projects

Located in Table 10-6, and as identified in Chapter 5 - The Changing Highway System, regionally significant highway projects have been identified that would, if implemented, expand and complement the existing transportation network. Currently, funding for these projects is not included in the financial plan. Nevertheless, these are recommended for further study.

Table 10-6 Regionally Significant Illustrative Highway Projects

Project	Cost Estimate
Bridgewater - Route 24 On Ramp From Route 104 Westbound	\$5,000,000
Plymouth - Exit 3 Full Interchange	\$28,000,000
Plymouth - Exit 5 Interchange and Long Pond Road Bridge Capacity Enhancement	\$30,000,000
Plymouth - Route 25 Interchange at Bourne Rd	\$25,000,000
Plymouth - Route 3 Exit 4 Northbound Off-ramp to Plymouth Plantation Highway	\$5,000,000
West Bridgewater - Route 106 Capacity Enhancement	\$10,000,000
Region - Route 3 Capacity Enhancement from Route 18 (Weymouth) to Long Pond Road (Plymouth)	To be determined
Region - Route 24 Capacity Enhancement and Upgrade to Interstate Standards	To be determined

10.5 Transit Funded Projects and Initiatives

10.5.1 Projected Revenue

Transit operations and capital projects are typically financed with a combination of federal, state, and local funds.

Federal

Brockton Area Transit Authority (BAT) receives the vast majority of its federal capital and operating assistance through the 49 U.S.C Section 5307 funding program. These formula grants are distributed annually on a percentage basis. In addition to funds from 49 Section 5307 of the United States Code, funds are also made available from Sections 5339, 5310, and, 5311. Estimated Federal funding for transit is outlined on Table 10-2.

State

The Commonwealth provides the Brockton Area Transit Authority (BAT) with financial assistance (through transportation bond issues and annual appropriations).

Annually, under the Community Transit Grant / Mobility Assistance Program (MAP), BAT typically requests 5-7 accessible mini-buses and vans each year, as part of their state of good repair and system preservation program.

Local

Communities within the Brockton Area Transit Authority (BAT) service area are assessed annually for transportation services.

Direct Income

Farebox revenues generate direct income. The MassDOT developed revenue estimates for the 24 years of the Regional Transportation Plan. To supplement these estimates, reasonable estimates of farebox, revenue, and Mobility Assistance Program and Section 5339 capital assistance were added to the Massachusetts Department of Transportation revenue forecasts.

Table 10-7 provides a listing of the estimated available transit funding through the year 2040.

Table 10-7: 2016-2040 Estimated Transit Funding

	2016 to 2020	2021 to 2025	2026 to 2030	2031 to 2035	2036 to 2040	Total
49 U.S.C. Section 5307	\$ 15,797,221	\$ 17,018,093	\$ 18,333,320	\$ 19,750,191	\$ 21,276,566	\$ 92,175,391
49 U.S.C. Section 5339	\$ 7,500,000	\$ 8,500,000	\$ 10,000,000	\$ 12,000,000	\$ 13,000,000	\$ 51,000,000
Commonwealth Programs for BAT						
State Contract Assistance	\$ 35,978,831	\$ 38,759,419	\$ 41,754,902	\$ 44,981,889	\$ 48,458,269	\$ 209,933,311
RTA Capital Assistance Program	\$ 12,763,750	\$ 13,349,736	\$ 14,381,457	\$ 15,492,914	\$ 16,690,268	\$ 72,678,125
Local Assessment	\$ 14,497,845	\$ 15,618,297	\$ 16,825,341	\$ 18,125,671	\$ 19,526,496	\$ 84,593,651
Farebox Revenue	\$ 20,244,468	\$ 21,809,041	\$ 23,494,531	\$ 25,310,282	\$ 27,266,362	\$ 118,124,685
Statewide Programs for all eligible participants						
49 U.S.C. Section 5310	\$ 3,091,360	\$ 3,330,273	\$ 3,587,650	\$ 3,864,918	\$ 4,163,614	\$ 18,037,814
Mobility Assistance Program (MAP)	\$ 3,515,000	\$ 3,922,163	\$ 4,225,284	\$ 4,551,831	\$ 4,903,614	\$ 21,117,892
	\$ 113,388,475	\$ 122,307,023	\$ 132,602,486	\$ 144,077,695	\$ 155,285,189	\$ 667,660,868

*The estimates from the MassDOT are based on the following assumptions: Federal Program and State Operating Assistance increase 1.5% each year from current levels to adjust for inflation.

10.5.2 Projected Expenses

The funding available has been allocated to operating, maintaining, and improving the transit transportation system.

Table 10-8: 2016-2040 Transit Operations and Capital Projects

	2016 to 2020	2021 to 2025	2026 to 2030	2031 to 2035	2036 to 2040	Total
§9 U.S.C. Section 5307	\$ 15,797,221	\$ 17,018,093	\$ 18,333,320	\$ 19,750,191	\$ 21,276,566	\$ 92,175,391
State Contract Operating Assistance	\$ 35,978,831	\$ 38,759,419	\$ 41,754,902	\$ 44,981,889	\$ 48,458,269	\$ 209,933,311
RTA Capital Assistance Program	\$ 12,763,750	\$ 13,349,736	\$ 14,381,457	\$ 15,492,914	\$ 16,690,268	\$ 72,678,125
BAT Fixed Route Bus Replacement, Hybrid Buses & Technologies, AVL, Farebox	\$ 8,320,000	\$ 11,841,954	\$ 14,407,548	\$ 17,528,985	\$ 21,326,691	\$ 73,425,178
BAT Intermodal Transportation Centre Improvements	\$ 500,000	\$ 1,000,000	\$ 1,250,000	\$ 1,500,000	\$ 2,150,000	\$ 6,400,000
BAT Ongoing Commuter Coach Replacement	\$ 624,000	\$ 1,776,293	\$ 1,080,566	\$ 1,314,674	\$ 1,599,502	\$ 6,395,034.93
BAT Ongoing Paratransit Bus Replacement	\$ 2,771,600	\$ 3,944,851	\$ 4,799,514	\$ 5,839,343	\$ 7,104,454	\$ 24,459,762
SSAC Ongoing Vehicle Replacement	\$ 1,444,768	\$ 2,056,355	\$ 2,501,871	\$ 3,043,908	\$ 3,703,380	\$ 12,750,282
Total Operating and Project Expenses	\$ 78,200,170	\$ 89,746,702	\$ 98,509,179	\$ 109,451,904	\$ 122,309,129	\$ 498,217,085
Total Available Operating and Capital Funding	\$ 113,388,475	\$ 122,307,023	\$ 132,602,486	\$ 144,077,695	\$ 155,285,189	\$ 667,660,868

10.5.3 Regionally Significant Illustrative Transit Projects

Located in Table 10-9 regionally significant transit projects have been identified that would, if implemented, expand and complement the existing transportation network. Currently, funding for the South Coast Rail Project is not included in the financial plan.

Table 10-9: Regionally Significant Illustrative Transit Projects

Region - South Coast Rail Project	\$2.3 billion
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10.6 Fiscal Constraint Analysis

Roadway, bridge operations and maintenance, as well as capital improvements, outlined in the Regional Transportation Plan, are estimated to cost approximately \$1.176 billion dollars as shown in Table 10-5 for the 24-year period (2016 to 2040). Additionally, transit operations and maintenance, as well as capital improvements, outlined in the Regional Transportation Plan, are estimated to cost approximately \$498 million dollars as shown in Table 10-8 for the 24-year period (2016 to 2040). In order to have a financially constrained plan, resources of an equal amount must be identified.

The funding available has essentially allocated to operating, maintaining, and modernizing the highway, bridge and transit transportation system. Large scale capacity enhancement projects are not included for funding with the financial plan of this regional transportation.

The financial capacity from federal, state, and local sources has been examined by comparing projected revenues to transportation needs as outlined in Tables 10-5 and 10-8. As a result, the Old Colony MPO concludes that the 2016 Regional Transportation Plan is financially constrained according to the definition in the Federal Register 23 CFR Part 450.

It is noted that the Regionally Significant Illustrative Projects listed in Table 10-6 and 10-9 are identified as capacity enhancement and mobility needs of the region and are recommended for study and specific funding is not programmed in the 2016 Regional Transportation Plan.

10.7 Conclusions and Recommendations

Invest funding to preserve, operate, and maintain transportation assets for current and future generations.

Adequately maintain and preserve all elements of the transportation system in a state of good repair to protect the public’s mobility, safety, and security.

Increase the efficiency and reliability of the transportation system using appropriate methods and technologies.

Invest and provide comparable transportation access and service quality across the region regardless of income level or minority population.

Provide adequate funding to ensure that the transportation system and its users are safe and secure.

Support the increase of the annual Chapter 90 statewide total amount to at least \$300 million.

Assist communities in preparing and updating their road inventories to ensure that they reflect accurate mileage amounts for publicly accepted roads.

Continue to review, develop, and analyze supplemental funding resources. Such resources could include increased user fees, transit mitigation banks, and concurrency management systems. Concurrency is the growth management concept intended to ensure that the necessary public facilities are available concurrent with the impacts of development.

Implement fare and revenue policies that increase with inflation. Ensure that revenue for transit operations keeps up with inflation.

Establish and dedicate transit funding from sources that increase with inflation.

Support congestion improvements and the reward for regional approaches to coordinating and interconnecting signalized intersections and corridors.

Support and enhance asset management capabilities to perform the appropriate type of improvement at the right time.

Support the establishment of a RTA service fund to restore and enhance service.

11 CONCLUSION AND SUMMARY OF RECOMMENDATIONS







This Regional Transportation Plan has documented that the region will face challenges as it grows and develops over the next twenty-five years. Infrastructure preservation, maintenance, safety, security, and reliability needs of the transportation network continue to strain resources and available funding sources. It is crucial that all agencies and organizations responsible for overseeing the transportation network anticipate these challenges and plan for them accordingly.

The recommendations presented in the previous chapters of this Plan were developed based on input received during from public outreach and stakeholder consultation, as well as developed by staff. The recommendations are aimed at achieving the Goals of this Plan that were presented in Chapter 2. The following reiterates this Plan’s Goals, and outlines those recommended strategies, actions, programs, and projects along with targets and performance measures that will guide the Old Colony MPO in achieving those Goals through the Year 2040.

11.1 Goal 1: Safety and Security

The first goal of this Regional Transportation Plan is to ensure that the transportation system and its users are safe and secure.

11.1.1 Targets for Measuring Performance Management

-  Reduce motor vehicle, pedestrian, and bicyclist fatalities, hospitalizations, and crashes by 10 percent in 10 years
-  Conduct Road Safety Audits for a minimum of 3 high crash locations (MassDOT Top 5% Crash Clusters) per year, including minimum of 1 pedestrian/walkability audit and one bicycle audit per year
-  Fully program minimum HSIP targets each TIP year and seek to program Statewide HSIP funds when available/feasible for priority safety related projects
-  Maintain fixed route service preventable accidents/ 100k miles below 2 (FY 2014 actual is 1.02) (from BAT Performance Dashboard)
-  Maintain demand response service preventable accidents/ 100k miles below 2 (FY 2014 actual is 1.20) (from BAT Performance Dashboard)
-  Increase percentage of SRTS Partner Schools to 85% in 10 years. Currently, 70% of eligible partner schools are partner schools

11.1.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Plan for the programming and implementation of those recommended highway projects (listed in Tables 5-1 and 5-2) from the Universe of Projects that are expected to yield significant safety improvements
- Target planning efforts and investments at identified high crash locations
- Reduce the rates of motor vehicle, bicycle, and pedestrian fatalities by incorporating engineering, enforcement, education, and emergency response into the planning process
- Use traffic calming techniques to protect neighborhoods in mixed use areas
- Support the improvement of pedestrian and bicycle safety and access around public transit stations





Chapter 11 – Conclusions and Recommendations

- Promote the installation of bicycle detection loops at actuated signalized intersection to increase safety for entering bicyclists
- Support local, regional, and state initiatives and legislation that create or maintain bicycle infrastructure and safety
- Install physical barriers, pavement markings, and other amenities where needed to maximize pedestrian safety
- Promote Installation of Pedestrian Countdown Signals at Signalized Intersections
- Promote Use of Crossing Islands and Medians in Wide Cross-Sections
- Increase partnership and participation by elementary and middle schools in the Safe Routes to School Program
- Encourage and promote safe bicycle riding, and reduce the number of injuries and fatalities associated with bicycle crashes
- Support local initiatives, which enact, implement and enforce laws and regulations regarding the protection and safety of pedestrians
- Support the increase and improvement of safety of services, vehicles, and facilities for transit, and for the transportation disadvantaged
- Support the implementation of emergency response and evacuation plans in cooperation with emergency management agencies
- Provide adequate funding to ensure that the transportation system and its users are safe and secure

11.2 Goal 2: System Preservation

The second goal of this Regional Transportation Plan is to maintain the transportation system in a state of good repair (SGR).

11.2.1 Targets for Measuring Performance Management

-  Increase miles between breakdowns with passenger interruption on fixed route to 20,000 (standard) within 10 years (currently 18,020) (from BAT Performance Dashboard)
-  Increase miles between breakdowns with passenger interruption on demand response to 10,000 (standard) within 10 years (currently 6,452) (from BAT Performance Dashboard)
-  Maintain percentage of bridges categorized “structurally deficient” below 5% and increase overall average AASHTO rating (current 79) by 10 percent by 2040
-  Achieve 50% of federal-aid eligible roadways in the region with a PCI-based pavement ranking of “Good” or “Excellent” within 10 years

11.2.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Plan for the programming and implementation of those recommended highway projects (listed in Tables 5-1 and 5-2) from the Universe of Projects that are expected to improve the physical condition of the infrastructure.
- Meet transit service operation needs by planning for fleet replacement as outlined in Table 6-1 in Chapter 6
- Adequately maintain and preserve all elements of the transportation system in a state of good repair to protect the public’s mobility, safety, and security
- Support the increase of the annual Chapter 90 statewide total amount to at least \$300 million.








Chapter 11 – Conclusions and Recommendations

- Assist communities in preparing and updating their road inventories to ensure that they reflect accurate mileage amounts for publicly accepted roads

11.3 Goal 3: Regional Mobility and Congestion Management

This third goal of this Regional Transportation Plan is to reduce congestion, improve mobility, and improve access to critical essential services.

11.3.1 Targets for Measuring Performance Management

-  Achieve 15% of commuters in the Old Colony region using healthy transportation modes (transit, walking, bicycling, etc.) within 10 years (10.5% of surveyed commuters in Old Colony Region were using transit, walking, or bicycling in the 2010 Massachusetts Travel Survey)
-  Monitor congestion levels on federal-aid eligible highway network annually, and highlight corridors with volume to capacity (v/c) ratios of 0.8 or greater for targeted study and/or improvements
-  Achieve average on-time ranking on fixed-route system of 98% by 2040 (from BAT Performance Dashboard)
-  100% of intermodal facilities with adequate bicycle parking by 2040
-  Record utilization data twice annually and report data to MassDOT
-  50% of communities with Complete Streets policies within 10 years
-  50% of available Transportation Improvement Program (TIP) funding allocated to projects that significantly improve bicycle and pedestrian mobility

11.3.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Plan for the programming and implementation of those recommended highway projects (listed in Tables 5-1 and 5-2) from the Universe of Projects that are expected to yield significant reductions in highway congestion
- *Develop the Needs of the Old Colony Region through a collaborate process with our communities and the Commonwealth*
- *Coordinate Transportation and Land Use*
- Improve highway capacity in the region, including examining the feasibility and supporting the expansion of Route 3 from Route 18 to Route 44, Route 106 in West Bridgewater, and several highway interchanges along the Routes 3 and 24 corridors
- Support “Complete Streets” Design In All Roadway Projects
- Support improved bicycle facilities to facilitate increased bicycle use as a transportation mode choice
- Enhance bicycle facilities at intermodal facilities (MBTA Stations, BAT Centre, Park and Ride)
- Continue to evaluate regional bicycle and pedestrian levels of service
- *Encourage the use of Access Management techniques*
- Support the expansion and enhancement of passenger rail service in the region and improved connections to other regions, such as South Coast Rail and extension of daily service to Buzzards Bay
- Support and plan for improved connections between transit service providers
- Support livability and sustainable development initiatives and planning policy that enable the population to choose healthy transportation modes over personal, single occupant vehicles for daily trips and subsequently aid in achieving mode shift goals



Chapter 11 – Conclusions and Recommendations

- Enhance planning efforts to plan for the transportation needs of an aging population
- *Continue to enhance the multi-modal transportation system*
- *Incorporate Intelligent Transportation Systems into the transportation planning process*
- *Support expanded fixed route service, including expanded lines and hours of service*
- *Support the continued funding of transit initiatives*
- Encourage increased use and expansion of commuter parking facilities
- Expand commuter services by private commuter carriers
- Seek to establish greater public/private partnerships in ferry operations
- Encourage the proper design and use of High Occupancy Vehicle (HOV) lanes
- Support congestion improvements and the reward for regional approaches to coordinating and interconnecting signalized intersections and corridors

11.4 Goal 4: System Reliability

The fourth goal of this Regional Transportation Plan is to improve the reliability of the transportation system.

11.4.1 Targets for Measuring Performance Management

-  Achieve average of 20K miles between breakdowns with passenger interruptions by 2025; and 25K miles by 2040 (from BAT Performance Dashboard)
-  Achieve average of 10K miles between breakdowns with passenger interruptions by 2025; and 15K miles by 2040 (from BAT Performance Dashboard)

11.4.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Support the use of Signal Priority in the BAT and GATRA service areas
- Increase the efficiency and reliability of the transportation system using appropriate methods and technologies
- Support the establishment of a RTA service fund to restore and enhance service

11.5 Goal 5: Economic Vitality

The fifth goal of this Regional Transportation Plan is to ensure a transportation system that provides a viable framework for fostering and supporting regional economic development and economic vitality.

11.5.1 Targets for Measuring Performance Management

- Address minimum of (2) freight corridors through UPWP every four years
- Minimum of 2 planning studies in UPWP every 4 years that address access to employment centers
- 100% of underpasses on freight corridors have highway standard vertical clearance by 2040

Chapter 11 – Conclusions and Recommendations



11.5.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Support transportation projects that facilitate access to employment and shopping centers, health care, and educational facilities
- Increase transit accessibility to underserved employment centers
- Encourage private sector participation in public transit operations
- Increase use of smaller general aviation airports
- Investigate potential of municipal airports' ability to serve as freight terminals
- Increase the level of freight/goods movement by rail in the Old Colony Region

11.6 Goal 6: Environmental Sustainability

The sixth goal of this Regional Transportation Plan is to enhance the performance of the transportation system while protecting and enhancing the natural environment.

11.6.1 Targets for Measuring Performance Management

-  Program a minimum of 100% of Congestion Mitigation and Air Quality (CMAQ) Program funding targets
-  50% of TIP projects reduce GHGs while also reducing negative impacts on the natural environment (such as improved storm water management or the addition of green space)

11.6.2 Recommended Actions for Achieving Goal and Performance Management Targets



- Minimize negative environmental impacts of the transportation system
- Support Livable and Sustainable Land Use Strategies
- Work towards Reducing Greenhouse Gas (GHG) emissions in the Transportation Sector
- Reduce dependency on fossil fuels
- Support the Commonwealth's Sustainable Development Principles
- Support MassDOT's Healthy Active Transportation Policy Directive
- Increase accessibility at the neighborhood scale
- Foster Healthy Communities and Neighborhoods By Supporting The Healthy Transportation Compact (HTC) and GreenDOT Initiatives
- Encourage and promote bicycle riding and pedestrian ways as viable mode shift choice to automobile commuting and as a means to improve air quality
- Encourage the Research and Usage of Alternative Energies
- Collaborate with Municipalities to Promote and Implement Stormwater Management Strategies
- Minimize the use of Road Salt and Sand
- Encourage the use of Renewable Energy
- Encourage the formation of Transportation Management Associations (TMAs)
- Continue Climate Change Adaptation Planning
- Promote the increase and enforcement of Corporate Average Fuel Economy (CAFE) Standards for passenger car and light truck fleets

11.7 Goal 7: Transportation System Equity

Chapter 11 – Conclusions and Recommendations

The seventh goal of this Regional Transportation Plan is to provide comparable transportation access and service quality across the region regardless of income level or minority population.

11.7.1 Targets for Measuring Performance Management

-  Provide translation services and hearing assistance devices upon request for all public meetings, and large font and translation services for all printed materials
-  Within five years, make recordings of all meetings available on electronic media

11.7.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Continue to screen all projects for benefits and burdens analysis as it pertains to minority populations and low-income populations
- Eliminate barriers to participation in the decision making process
- Continue current outreach programs to underserved populations
- Ensure that environmental burdens are not disproportionately impacting environmental justice communities.

11.8 Goal 8: Reduced project delivery costs.

The eight goal of this Regional Transportation Plan is to reduce project costs through a deliberate and thorough project evaluation process at the MPO planning level of project development.

11.8.1 Targets for Measuring Performance Management

- 100% of all potential projects undergo initial evaluation to determine if project is realistic, viable, and implementable
- 100% of potential Year 1 TIP projects are screened for implementation readiness
- At least 80% of Year 1 TIP Projects are advertised
- 100% attendance and participation at TIP Day
- At 25% design stage, work with stakeholders on 100% of potential projects to determine ROW, environmental permitting, and other potential challenges to project development and implementation

11.8.2 Recommended Actions for Achieving Goal and Performance Management Targets

- Invest funding to preserve, operate, and maintain transportation assets for current and future generations
- Support and enhance asset management capabilities to perform the appropriate type of improvement at the right time

ADMINISTRATIVE MODIFICATIONS AND AMENDMENTS

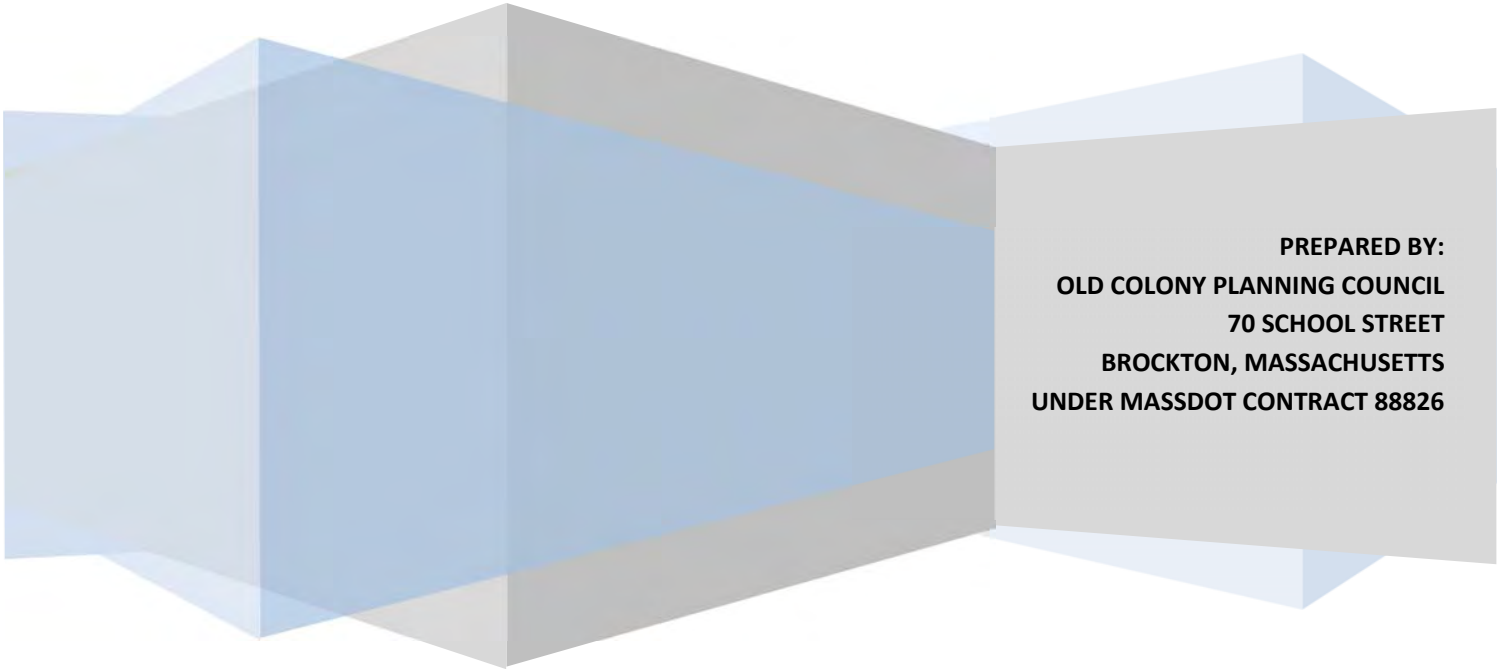
OLD COLONY METROPOLITAN PLANNING ORGANIZATION (MPO)

MovingU 2040: 2016 OLD COLONY LONG RANGE TRANSPORTATION PLAN (RTP) Amendment 1

- **ENDORSED BY THE OLD COLONY MPO ON AUGUST 21, 2018
FOLLOWING A 21-DAY PUBLIC REVIEW AND COMMENT PERIOD**

PREPARED IN COOPERATION WITH:

- **BROCKTON AREA TRANSIT AUTHORITY (BAT)**
- **FEDERAL HIGHWAY ADMINISTRATION (FHWA)**
- **FEDERAL TRANSIT ADMINISTRATION (FTA)**
- **MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT)**



**PREPARED BY:
OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MASSACHUSETTS
UNDER MASSDOT CONTRACT 88826**

Notice of Nondiscrimination Rights and Protections to Beneficiaries

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The Old Colony Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of **race, color, or national origin** (including **limited English proficiency**), be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of **age, sex, and disability**. These protected categories are contemplated within the Old Colony MPO's Title VI Programs consistent with federal interpretation and administration. Additionally, the Old Colony MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with US Department of Transportation policy and guidance on federal Executive Order 13166.

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Additional Information

To request additional information regarding Title VI and related federal and state nondiscrimination obligations, please contact:

Old Colony Planning Council
Title VI/ Nondiscrimination Coordinator
Pat Ciaramella
70 School Street
Brockton, MA 02301
508-583-1833 Extension 202
pciaramella@ocpcrpa.org

Title VI Specialist
MassDOT, Office of Diversity and Civil Rights
10 Park Plaza
Boston, MA 02116
857-368-8580
TTY: 857-368-0603
MASSDOT.CivilRights@state.ma.us

Complaint Filing

To file a complaint alleging a violation of Title VI or related federal nondiscrimination law, contact the Title VI Specialist (above) within 180 days of the alleged discriminatory conduct.

To file a complaint alleging a violation of the state's Public Accommodation Law, contact the Massachusetts Commission Against Discrimination within 300 days of the alleged discriminatory conduct at:

Massachusetts Commission Against Discrimination (MCAD)
One Ashburton Place, 6th Floor
Boston, MA 02109
617-994-6000
TTY: 617-994-6196

Translation

English

If this information is needed in another language, please contact the MPO Title VI Coordinator at 508-583-1833 ext. 202.

Spanish

Si necesita esta información en otro idioma, por favor contacte al coordinador de MPO del Título VI al 508-583-1833 ext. 202.

Portuguese

Caso estas informações sejam necessárias em outro idioma, por favor, contate o Coordenador de Título VI da MPO pelo telefone 508-583-1833, Ramal 202

Chinese Simple

如果需要使用其它语言了解信息，请联系Old Colony大都会规划组织（MPO）《民权法案》第六章协调员，电话508- 583-1833，转202。

Chinese Traditional

如果需要使用其他語言瞭解資訊，請聯繫Old Colony大都會規劃組織（MPO）《民權法案》第六章協調員，電話508- 583-1833，轉202。

Vietnamese

Nếu quý vị cần thông tin này bằng tiếng khác, vui lòng liên hệ Điều phối viên Luật VI của MPO theo số điện thoại 508- 583-1833, số máy nhánh 202.

Haitian Creole

Si yon moun bezwen enfòmasyon sa a nan yon lòt lang, tanpri kontakte Koòdonatè a Title VI MPO nan 508-583-1833 ext. 202.

French Creole

Si yon moun vle genyen enfòmasyon sa yo nan yon lòt lang, tanpri kontakte Kowòdinatè MPO Title VI la nan nimewo 508-583-1833, ekstansyon 202.

Russian

Если Вам необходима данная информация на любом другом языке, пожалуйста, свяжитесь с Координатором Титула VI в МРО по тел: 508-583-1833, добавочный 202.

French

Si vous avez besoin d'obtenir une copie de la présente dans une autre langue, veuillez contacter le coordinateur du Titre VI de MPO en composant le 508-583-1833, poste 202.

Italian

Se ha bisogno di ricevere queste informazioni in un'altra lingua si prega di contattare il coordinatore MPO del Titolo VI al 508- 583-1833 interno 202

Mon-Khmer, Cambodian

ប្រសិនបើលោក-អ្នកត្រូវការបកប្រែព័ត៌មាននេះ សូមទាក់ទងអ្នកសម្របសម្រួលជំពូកទី6 របស់ **MPO** តាមរយៈលេខទូរស័ព្ទ **508-583-1833** រួចភ្ជាប់ទៅលេខ **202**។

Arabic

إذا كنت بحاجة إلى هذه المعلومات بلغة أخرى، يُرجى الاتصال بمنسق الفقرة السادسة لمنظمة التخطيط الحضري على الهاتف: 508- 583-1833 و ثم اضغط الأرقام 202.

Updated April 2015

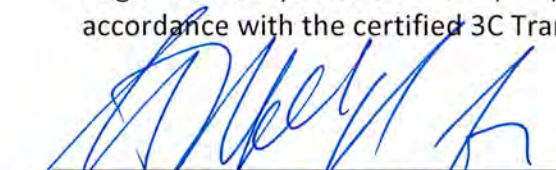
Old Colony Planning Council

OLD COLONY METROPOLITAN PLANNING ORGANIZATION (MPO)


2016 OLD COLONY REGIONAL TRANSPORTATION PLAN (RTP) AMENDMENT 1

**ENDORSEMENT OF
2016 OLD COLONY REGIONAL TRANSPORTATION PLAN (RTP) AMENDMENT 1**

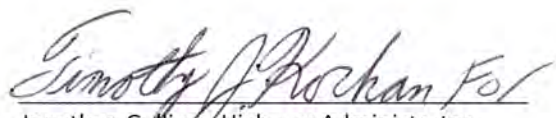
This is to certify that the Signatories of the Old Colony Metropolitan Planning Organization, at their Old Colony MPO Meeting on August 21, 2018 hereby approve and endorse the 2016 Old Colony Regional Transportation Plan (RTP) Amendment 1 in its entirety for the Old Colony Region, in accordance with the certified 3C Transportation Planning Process.

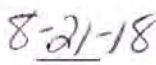

Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation

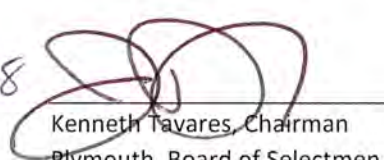

Date

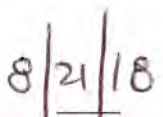

The Honorable Bill Carpenter, Mayor
City of Brockton

Date

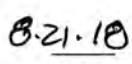

Jonathan Gulliver, Highway Administrator
Massachusetts Department of Transportation

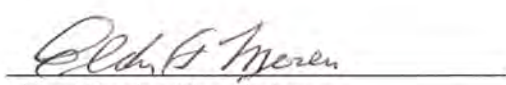

Date


Kenneth Tavares, Chairman
Plymouth, Board of Selectmen

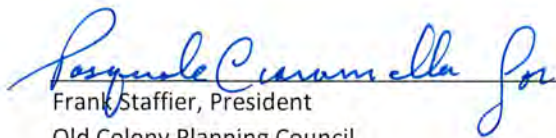

Date

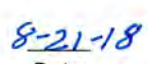

Reinald Ledoux, Jr., Administrator
Brockton Area Transit

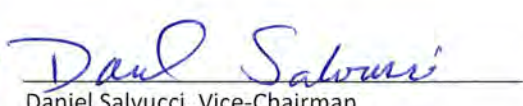

Date


Eldon Moreira, Vice-Chairman
West Bridgewater, Board of selectmen


Date


Frank Staffier, President
Old Colony Planning Council


Date


Daniel Salvucci, Vice-Chairman
Whitman, Board of selectmen


Date

Ex-Officio Non-Voting Members

Noreen O'Toole, Chairperson
Old Colony Joint Transportation Committee (JTC)

Jeff McEwen, Massachusetts Division Administrator
Federal Highway Administration (FHWA)

Peter Butler, Acting Region 1 Administrator
Federal Transit Administration (FTA)

OLD COLONY PLANNING COUNCIL

Frank Staffier
President
70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director
Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: information@ocpcrpa.org

July 17, 2018

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD

2016 REGIONAL TRANSPORTATION PLAN (RTP) AMENDMENT 1

In accordance with the Public Participation Process, the Old Colony Metropolitan Planning Organization (MPO) is making the 2016 Regional Transportation Plan (RTP) Amendment 1 available for a twenty-one (21) day public review and comment period. Copies of this Amendment 1 are available for review at the Old Colony Planning Council Offices (8:30 a.m. to 4:00 p.m.), at <http://www.ocpcrpa.org/>, and/or upon request. This process will also be used as Brockton Area Transit Authority's (BAT) public participation process. BAT, the Federal Transit Administration (FTA) Section 5307(c) applicant, has consulted with the Old Colony MPO and concurs that the public involvement process adopted by the Old Colony MPO for development of the TIP satisfies the public hearing requirements that pertain to the development of the Program of Projects for the regular Section 5307, Urbanized Area Formula Program, grant applications including the provisions for public notice and the time established for public review and comment. Public notice of public involvement activities and time established for public review and comments on the TIP will satisfy the program of projects (POP) requirements. The public discussion of the TIP at Old Colony Joint Transportation Committee (JTC), Old Colony MPO, and transportation meetings satisfies the Program of Projects (POP) public hearing requirements of the FTA. A public meeting of the Old Colony JTC is scheduled for August 2, 2018 at 12 PM. Furthermore, a public meeting of the Old Colony MPO is scheduled for August 21, 2018 at 10 AM to hear additional public comments and consider endorsement. Please contact Charles Kilmer at 508-583-1833 Extension 206 for further information. Please send written comments to: Charles Kilmer c/o Old Colony Planning Council, 70 School Street, Brockton, MA 02301.

The Old Colony MPO fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. The Old Colony MPO operates without regard to race, color, or national origin (including limited English proficiency), age, sex, disability, ancestry, ethnicity, gender, gender identity or expression, sexual orientation, religion, creed, veteran's status, or background. Any person who believes him/herself or any specific class of persons, to be subject to discrimination prohibited by Title VI may by him/herself or by representative file a written complaint with the Old Colony MPO. Complaints are to be filed no later than 180 days from the date of the alleged discrimination. Please contact Pat Ciaramella at 508-583-1833 Extension 202 for more information.

AIR QUALITY CONFORMITY DETERMINATION

Massachusetts Department of Transportation (MassDOT) and the Metropolitan Planning Organizations (MPOs)

July 2018

Introduction

This report documents the air quality conformity determination for the Massachusetts metropolitan planning organizations' 2016 regional transportation plans (RTPs) for the 1997 ozone National Ambient Air Quality Standards (NAAQS). It consists of the analysis of future vehicle emissions of ozone precursor pollutants.

Statewide Ozone Precursor Analysis

Legislative Background on Ozone

The 1970 Clean Air Act defined a one-hour national ambient air quality standard (NAAQS) for ground-level ozone. The 1990 Clean Air Act Amendments further classified degrees of nonattainment of the one-hour standard based on the severity of monitored levels of the pollutant. The entire Commonwealth of Massachusetts was classified as being in serious nonattainment for the one-hour ozone standard, with a required attainment date of 1999; this was later extended first to 2003, then to 2007.

In 1997, the U.S. Environmental Protection Agency (EPA) proposed a new, eight-hour ozone NAAQS to replace the one-hour standard, effective June 15, 2005. The new standard was challenged in court, and after a lengthy legal battle, the courts upheld the standard, which was finalized in June 2004. The eight-hour standard was 0.08 parts per million (ppm), averaged over eight hours and not to be exceeded more than once per year. Nonattainment areas were again further classified based on the severity of eight-hour values. Massachusetts as a whole was classified as being in moderate nonattainment for the eight-hour standard, but it was separated into two nonattainment areas—Eastern Massachusetts and Western Massachusetts. Both nonattainment areas were required to reduce its emissions of VOCs and NO_x to achieve attainment of the eight-hour ozone NAAQS by 2009.

In March 2008, EPA published revisions to the eight-hour ozone NAAQS that established a level of 0.075 ppm (March 27, 2008; 73 FR 16483). After reviewing data from Massachusetts monitoring stations, the EPA sent a letter on December 16, 2011, proposing that only Dukes County would be designated as being in nonattainment for the new, proposed 0.075 ozone standard. Massachusetts concurred with these findings.

On May 21, 2012, the final rule (77 FR 30088) was published in the Federal Register, defining the 2008 NAAQS at 0.075 ppm, the standard that was promulgated in March 2008. A second rule (77 FR 30160), published on May 21, 2012, revoked the 1997 ozone NAAQS; the rule was to become effective one year after the 2008 NAAQS became effective (July 20, 2012). Also on May

AIR QUALITY CONFORMITY DETERMINATION

21, 2012, the air quality designation areas for the 2008 NAAQS were published in the Federal Register. In this Federal Register, the only area in Massachusetts that was designated as being in nonattainment for ozone was Dukes County. All other counties were classified as unclassifiable/ attainment. Therefore, the 13 MPOs are not required to perform a conformity determination for ozone for their regional transportation plans (RTP).

All of the Massachusetts MPOs and MassDOT continue to meet the requirements of air quality conformity according to the Code of Federal Regulations, and as evaluated through inter-agency consultation. Specifically, on March 6, 2015, (80 FR 12264, effective April 6, 2015) EPA published the Final Rulemaking, "Implementation of the 2008 National Ambient Air Quality Standards (NAAQS) for Ozone: State Implementation Plan Requirements; Final Rule." This rulemaking removed transportation conformity to the 1997 Ozone NAAQS (the standard the subject of a December 23, 2014 DC Circuit Court decision). Link to Final EPA Rulemaking: <http://www.gpo.gov/fdsys/pkg/FR-2015-03-06/pdf/2015-04012.pdf>

Since the current LRTPs adopted by the MPOs in August 2015 were developed, reviewed, and approved after April 6, 2015, air quality conformity determinations to the 1997 Ozone NAAQS was no longer required, as those standards and all associated area designations were permanently replaced by the 2008 NAAQS, which (with actually a stricter level of allowable ozone concentration than the 1997 standards) no longer designate Massachusetts as a non-attainment area(s) for ozone except for Dukes County as discussed above.

Since the adoption of the current LRTPs in 2015, new guidance has been released by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) regarding transportation conformity requirements. The United States Court of Appeals for the DC Circuit issued a decision in the *South Coast Air Quality Management District v. EPA*, No. 15-1115 in February 2018, which struck down portions of the *2008 Ozone NAAQS SIP Requirements Rule* concerning the ozone NAAQS.

The portions of the *2008 Ozone NAAQS SIP Requirements Rule* addressed implementation requirements of the 2008 ozone NAAQS as well as the anti-backsliding requirements (ensuring that areas do not revert back to nonattainment) associated with the revocation of the 1997 ozone NAAQS. The impact of the decision addresses two groups of ozone areas described in the decision, one of which affects Massachusetts. It affects areas that were designated as nonattainment for the 1997 ozone NAAQS at the time of revocation and are designated as attainment for the 2008 ozone NAAQS. These areas have not been required to make transportation conformity determinations for any ozone NAAQS since the 1997 ozone NAAQS were revoked by EPA in April 2016.

With this new court ruling, Massachusetts is required to perform a transportation conformity determination on any new RTP and transportation improvement program (TIP), updates, and amendments that include the addition of a project that is not exempt (also known as a

AIR QUALITY CONFORMITY DETERMINATION

regionally significant project) from transportation conformity.

In past transportation conformity determinations, it has been the policy that the TIP comes from an air quality conforming RTP. As a result of this recent court ruling and with the guidance of FHWA and FTA, the MPOs are now required to perform a conformity determination for ozone since a conformity determination was not performed for the current RTP. MassDOT, after consultation with FHWA, FTA, EPA, and the Massachusetts Department of Environmental Protection (DEP), has determined that the MPOs would perform a conformity determination on the current RTPs, allowing each TIP to come from an air quality conforming RTP. This will allow for the approval of each MPO's 2019–2023 TIP and any other TIP amendments that may occur over the next year, prior to the adoption of the new RTPs in May 2019.

Legislative Background on Carbon Monoxide

Although this document reports on statewide ozone precursor emissions, reporting on another criteria pollutant, carbon monoxide (CO) is still federally required for some MPOs in Massachusetts. The cities of Boston, Cambridge, Chelsea, Everett, Malden, Medford, Quincy, Revere, and Somerville within the Boston Region MPO were classified as being in attainment for CO emissions with a carbon monoxide maintenance plan approved as part of the SIP. A conformity analysis for carbon monoxide was done as part of the current LRTP in 2015. However, as of April 1, 2016, the 20-year maintenance period for this carbon monoxide maintenance area expired and transportation conformity is no longer required for this pollutant in these communities. This ruling is documented in a letter from the EPA dated May 12, 2016.

The Lowell, Waltham, Worcester, and Springfield carbon monoxide areas are classified attainment with a limited maintenance plan in place. No regional air quality analysis is required in limited maintenance plan areas as emissions may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that such areas will experience so much growth in that period that a violation of the carbon monoxide NAAQS would result. Therefore, in areas with approved limited maintenance plans, Federal actions requiring conformity determinations under the transportation conformity rule are considered to satisfy the “budget test.” All other transportation conformity requirements under 40 CFR 93.109(b) continue to apply in limited maintenance areas, including project level conformity determinations based on carbon monoxide hot spot analyses under 40 CFR 93.116. The latest conformity determinations for Lowell, Waltham, Worcester, and Springfield can be found in the respective MPO's 2019–2023 TIPs.

Air Quality Analysis Criteria

The air quality analysis was prepared using the following criteria:

- The horizon years for the travel demand model analysis are established as 2012 (base year), 2020, 2030, and 2040.

AIR QUALITY CONFORMITY DETERMINATION

- Projections for future population, employment, and households were developed jointly by MassDOT, the Metropolitan Area Planning Council, and the Donahue Institute of the University of Massachusetts. This was a cooperative and iterative process conducted throughout 2014 and into 2015, with input and comments from each MPO in the Commonwealth.
- Demographic projections were incorporated into the statewide travel demand model, along with updated travel characteristics, obtained through the 2010-2011 Massachusetts Travel Survey and the U.S. Census.
- The transit service assumptions for the MBTA were included in this analysis and were based on MBTA service in the spring of 2012. Travel demand model calibration was performed using the Ridership and Service Statistics, MBTA Blue Book.
- Factors used for calculating emissions changes were determined using the EPA's latest emissions model, Motor Vehicle Emissions Simulator (MOVES) 2014. Inputs used for 2012 through 2040 were received from the DEP and include information about programs that were submitted to the EPA as the strategy for the Commonwealth to attain ambient air quality standards.
- The Federal Highway Administration's Highway Performance Monitoring System (HPMS) is used to track daily vehicle-miles of travel (VMT). For each MPO region, adjustment factors that compare the 2012 HPMS VMT to the 2012 base year VMT estimated by the travel demand models transportation model VMT were developed. The adjustment factors were then applied to all modeled VOC and NOx emissions for the years 2020 through 2040 to ensure consistency with EPA-accepted procedures.

Inclusion of Regionally Significant Transportation Projects

Only "regionally significant" projects are included in the travel-demand modeling. Regionally significant projects are defined as follows:

A transportation project (other than an exempt project) that is on a facility that serves regional transportation needs (such as access to and from the area outside of the MPO region; major activity centers in the region; major planned developments, such as new retail malls and sport complexes; and transportation terminals (as well as most terminals themselves) and would be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed-guideway transit facilities that offer an alternative to regional highway travel.

AIR QUALITY CONFORMITY DETERMINATION

The following table lists the regionally significant projects proposed in the RTPs:

Regionally Significant Projects Included in the Travel Demand Model

Analysis Year	Community	Project Description
2020	Bedford and Billerica	Middlesex Turnpike Improvements, from Crosby Drive North to Manning Road, Phase III
2020	Newton and Needham	Reconstruction of Highland Avenue, Needham Street and Charles River Bridge, from Webster Street to Route 9
2020	Weymouth and Abington	Reconstruction and Widening on Route 18 (Main Street), from Highland Place to Route 139
2020	Woburn	Reconstruction of Montvale Avenue, from I-93 Interchange to Central Street
2020	Woburn	Bridge Replacement, New Boston Street over MBTA
2030	Boston	Reconstruction of Rutherford Avenue, from City Square to Sullivan Square
2030	Framingham	Intersection Improvements at Route 126 and Route 135/MBTA and CSX Railroad
2030	Lexington	Route 4/225 (Bedford Street) and Hartwell Avenue
2030	Natick	Bridge Replacement, Route 27 (North Main Street) over Route 9 (Worcester Street) and Interchange Improvements
2030	Somerville	McGrath Boulevard Project
2040	Barnstable	Hyannis Access Improvements
2030	Westborough	Route 9 Improvements
2030	Oxford	Route 20 Capacity Improvement
2030	Millbury	Turnpike/Route 146 Intersection Improvement
2030	Worcester	I-290 Bridge Expansion
2030	North Andover	Route 114 Reconstruction
2030	Athol	Route 2 Interchange @ South Athol Rd
2040	Philipston to Athol	Route 2 Expansion
2040	Westford	Route 110 Widening
2040	Tewksbury, Andover	Lowell Junction Interchange
2020	Wilbraham	Boston Road Reconstruction
2020	Hadley	Route 9 Phase 1
2030	Hadley	Route 9 Phase 2
2030	Hadley	Route 9 Phase 3
2030	Middleborough	Routes 44/28/18 Rotary
2040	Taunton	Routes 24 & 140 Improvements
2040	Fall River	Route 79 Boulevard

AIR QUALITY CONFORMITY DETERMINATION

Emissions Inventory Assumptions

This air quality analysis was done in relation to the State Implementation Plan mobile-source ozone emission projections that were approved in March 2008 for the revoked 1997 eight-hour NAAQS for VOC and NOx. The VOC mobile-source emission budget for 2009 for the Eastern Massachusetts Ozone Nonattainment Area was set at 63.50 tons per summer day and at 10.73 tons per summer day for the Western Massachusetts Ozone Nonattainment Area. The NOx mobile-source emission budget for 2009 for the Eastern Massachusetts Ozone Nonattainment Area was set at 174.96 tons per summer day and at 27.73 tons per summer day for the Western Massachusetts Ozone Nonattainment Area.

The Massachusetts Department of Transportation, Office of Transportation Planning (MassDOT Planning) estimated the results for the Eastern and Western Massachusetts Ozone Nonattainment Areas using the Statewide travel demand model set, based on the latest planning assumptions (as outlined in this document).

Ozone Analysis Results

MassDOT's Office of Transportation Planning conducted an air quality conformity analysis for the Commonwealth's 13 MPO's 2016 Regional Transportation Plans. The purpose of the conformity test is to show consistency with the emissions budgets set forth in the SIP. Additional specific information regarding the analysis and modeling methods, latest planning assumptions, and consultation procedures are all detailed in each MPO's 2016 RTP (and appendices).

The test used in this analysis was to show that the RTPs are consistent with the emission budgets set for the revoked 1997 eight-hour ozone NAAQS as described above. The results are shown in the tables below. They include emissions from regionally significant projects as represented in the statewide travel demand model and off-model emissions from commuter rail, commuter boat, and buses:

The emissions from the following MPOs have been combined to show conformity with the SIP for the Eastern Massachusetts Ozone Nonattainment Area:

- Cape Cod MPO
- Central Massachusetts MPO
- Merrimack Valley MPO
- Boston MPO
- Montachusett Region MPO
- Northern Middlesex MPO
- Old Colony MPO
- Southeastern Region MPO

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- Martha's Vineyard Commission*
- Nantucket Planning and Economic Development Commission*

* These regions do not contain any official urbanized areas, but are considered to be MPOs for planning purposes.

VOC Emissions Estimates Eastern Massachusetts Ozone Nonattainment Area (All emissions in tons per summer day: tpsd)

Year	VOC Action Emissions	VOC Budget	Difference (Action – Budget)
2012	30.56	n/a	n/a
2020	6.68	63.50	-56.82
2030	5.68	63.50	-57.82
2040	4.69	63.50	-58.81

NOx Emissions Estimates Eastern Massachusetts Ozone Nonattainment Area (tpsd)

Year	NOx Action Emissions	NOx Budget	Difference (Action – Budget)
2012	116.97	n/a	n/a
2020	27.24	174.96	-147.72
2030	20.63	174.96	-154.33
2040	14.02	174.96	-160.94

The emissions from the following MPOs have been combined to show conformity with the SIP for the Western Massachusetts Nonattainment Area:

- Berkshire Region MPO
- Franklin Regional Council of Governments*

AIR QUALITY CONFORMITY DETERMINATION

- Pioneer Valley MPO

* This region does not contain any official urbanized areas, but is considered to be an MPO for planning purposes.

VOC Emissions Estimates Western Massachusetts Ozone Nonattainment Area (tpsd)

Year	VOC Action Emissions	VOC Budget	Difference (Action – Budget)
2012	3.61	n/a	n/a
2020	1.08	10.73	-9.65
2030	1.02	10.73	-9.71
2040	0.96	10.73	-9.77

NOx Emissions Estimates Western Massachusetts Ozone Nonattainment Area (tpsd)

Year	NOx Action Emissions	NOx Budget	Difference (Action – Budget)
2012	13.10	n/a	n/a
2020	5.03	27.73	-22.70
2030	3.97	27.73	-23.76
2040	2.92	27.73	-24.81

Based on the preceding results, MassDOT Planning has found that the combined emission levels from transportation projects contained in the 2016 Regional Transportation Plans and 2019–2023 Transportation Improvement Programs – for both former ozone nonattainment areas in Massachusetts – demonstrate conformity with the SIP, the Clean Air Act, and the EPA conformity regulations (40 CFR part 51).

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Through the interagency air quality consultation process (involving U.S. Department of Transportation, EPA, DEP, MassDOT, and the MPOs) the latest EPA rulemakings, and the referenced legislative background and legal issues, currently applicable ozone standards, area designations, and requirements were all reviewed.

The ozone analysis outlined in this section demonstrates that the implementation of the 2016 RTPs and 2019–2023 TIPs meets the “budget test,” and therefore satisfy the air quality ozone and carbon monoxide conformity criteria, and is consistent with the air quality goals in the Massachusetts SIP.

LEGAL ADVERTISEMENTS

Notice of Twenty-One Day Public Review and Comment Period appeared in the following:

- **The Brockton Enterprise (July 17, 2018)**
- **The Ojournal (July 20, 2018)**
- **The Patriot Ledger (July 17, 2018)**

Legals
676 Broadway, Hanover, MA

2018 Regional Transportation Plan

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD
2018 REGIONAL TRANSPORTATION PLAN (RTP) AMENDMENT 1

In accordance with the Public Participation Process, the Old Colony Metropolitan Planning Organization (MPO) is making the 2018 Regional Transportation Plan (RTP) Amendment 1 available for a twenty-one (21) day public review and comment period. Copies of this Amendment 1 are available for review at the Old Colony Planning Council Offices (8:30 a.m. to 4:00 p.m.), at <http://www.ocmprpa.org/>, and/or upon request. This process will also be used as Brockton Area Transit Authority's (BAT) public participation process. BAT, the Federal Transit Administration (FTA) Section 5307(c) applicant, has consulted with the Old Colony MPO and concurs that the public involvement process adopted by the Old Colony MPO for development of the TIP satisfies the public hearing requirements that pertain to the development of the Program of Projects for the regular Section 5307, Urbanized Area Formula Program, grant applications including the provisions for public notice and the time established for public review and comment. Public notice of public involvement activities and time established for public review and comments on the TIP will satisfy the program of projects (POP) requirements. The public discussion of the TIP at Old Colony Joint Transportation Committee (JTC), Old Colony MPO, and transportation meetings satisfies the Program of Projects (POP) public hearing requirements of the FTA. A public meeting of the Old Colony JTC is scheduled for August 2, 2018 at 12 PM. Furthermore, a public meeting of the Old Colony MPO is scheduled for August 21, 2018 at 10 AM to hear additional public comments and consider endorsement. Please contact Charles Kilmer at 508-583-1833 Extension 206 for further information. Please send written comments to: Charles Kilmer c/o Old Colony Planning Council, 70 School Street, Brockton, MA 02301.

CN13707983
Enterprise, Patriot Ledger 7/17/18

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Legals
Commonwealth of Massachusetts
The Trial Court

named person. If the above-named person cannot afford a lawyer, one may be appointed at State expense.
WITNESS, Hon. Edward G. Boyle, III, First Justice of this Court.
Date: June 26, 2018
Matthew J. McDonough
Register of Probate
13708576 7/17/18

Commonwealth of Massachusetts
The Trial Court
Probate and Family Court
Plymouth Probate and Family Court
52 Obery Street
Suite 1130
Plymouth, MA 02360
(508)747-6204
Docket No. PL18C0122CA

NOTICE OF PETITION FOR CHANGE OF NAME

In the matter of: Epiphane Lazarre Of: Bridgewater, MA

To all persons interested in petition described:
A petition has been presented by Epiphane Lazarre requesting that: Epiphane Lazarre be allowed to change his/her name as follows:

Epiphany Lazarus Lazarre King, Jr.

IF YOU DESIRE TO OBJECT THERETO, YOU OR YOUR ATTORNEY MUST FILE A WRITTEN APPEARANCE IN SAID COURT AT: Plymouth ON OR BEFORE TEN O'CLOCK IN THE MORNING (10:00 AM) ON 07/31/2018.

WITNESS Hon. Edward G. Boyle, First Justice of this Court.

Date: July 3, 2018
Matthew J. McDonough
Register of Probate

Legals
TRIAL COURT OF MASSACHUSETTS

Enterprise
City/Town: Town of Bridgewater
Robert S. Creighton, Jr., Clerk of Courts
date issued: 6/28/18

13708351
7/17,24,31, 2018
Commonwealth of Massachusetts
The Trial Court
Probate and Family Court
Plymouth Division
Docket No. PL18P1301EA
INFORMAL PROBATE PUBLICATION NOTICE
Estate of: Edith M. Clemons
Date of Death: May 27, 2018

To all persons interested in the above captioned estate: By Petitioner David A. Clemons of Middleboro MA a Will has been admitted to informal probate.

David A. Clemons of Middleboro MA has been informally appointed as the Personal Representative of the estate to serve without surety on the bond.

The estate is being administered under informal procedure by the Personal Representative under the Massachusetts Uniform Probate Code without supervision by the Court. Inventory and accounts are not required to be filed with the Court, but interested parties are entitled to notice regarding the administration from the Personal Representative and can petition the Court in any matter relating to the estate, including distribution of assets and expenses of administration.

Interested parties are entitled to petition the Court to institute formal proceedings and to obtain orders terminating or restricting the powers of the Personal Representative appointed under informal procedure. A copy of the Petition and Will, if any, can be obtained from the Publisher.

Legals
van leer

Commonwealth of Massachusetts
Boyle, First Justice of this Court.
Date: June 28, 2018
Matthew J. McDonough
Register of Probate
13706191 7/17/18

Commonwealth of Massachusetts
The Trial Court
Probate and Family Court
Plymouth Probate and Family Court
52 Obery Street
Suite 1130
Plymouth, MA 02360
(508)747-6204
Docket No. PL18C0080CA

NOTICE OF PETITION FOR CHANGE OF NAME

In the matter of: Carlyn Denice Brooks Of: Brockton, MA

To all persons interested in petition described:

A petition has been presented by Carlyn D Brooks requesting that: Carlyn Denice Brooks be allowed to change his/her name as follows:

Carolyn Denise Brooks

IF YOU DESIRE TO OBJECT THERETO, YOU OR YOUR ATTORNEY MUST FILE A WRITTEN APPEARANCE IN SAID COURT AT: Plymouth ON OR BEFORE TEN O'CLOCK IN THE MORNING (10:00 AM) ON 08/03/2018.

WITNESS Hon. Edward G. Boyle, First Justice of this Court.

Date: July 5, 2018

Matthew J. McDonough
Register of Probate
13707469 7/17/18

Legals
jean benton

Commonwealth of Massachusetts
Date: June 27, 20187
Matthew J. McDonough
Register of Probate
13706881 7/17/18

Public Auction 8/2

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CSY Design Corporation, #2516 10.0 x 15.0; Chairs, Boxes, Totes, Furniture, Pots
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TERM: Cash. Units sold by entirety.

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Announcements

CLIFTON ASSISTED LIVING is now accepting CNA Applications for dedicated & compassionate team members...

Part Time positions on our 3-11 shifts

Per Diem hours are available on all shifts

The "Inn" at Clifton is seeking mature, responsible and self-motivated individuals to join our nursing team.

Interested candidates please send resume to rlledoux@cliftonassistedliving.com or apply in person at Clifton Assisted Living 444 Wilbur Ave. Somerset, MA 02725 508-324-0200 EOE



EMPLOYMENT

Help Wanted

Construction
John Rocchio Corporation, a heavy civil & utility contractor has immediate openings for Project Managers, Superintendents & Foremen. Interested individuals should visit our website at johnrochiocorp.com for position descriptions & contact info. **John Rocchio Corporation** is an Equal Employment Opportunity Employer

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD 2016 REGIONAL TRANSPORTATION PLAN (RTP) AMENDMENT 1

In accordance with the Public Participation Process, the Old Colony Metropolitan Planning Organization (MPO) is making the 2016 Regional Transportation Plan (RTP) Amendment 1 available for a twenty-one (21) day public review and comment period. Copies of this Amendment 1 are available for review at the Old Colony Planning Council Offices (8:30 a.m. to 4:00 p.m.), at <http://www.ocprcpa.org/>, and/or upon request.

This process will also be used as Brockton Area Transit Authority's (BAT) public participation process. BAT, the Federal Transit Administration (FTA) Section 5307(c) applicant, has consulted with the Old Colony MPO and concurs that the public involvement process adopted by the Old Colony MPO for development of the TIP satisfies the public hearing requirements that pertain to the development of the Program of Projects for the regular Section 5307, Urbanized Area Formula Program, grant applications including the provisions for public notice and the time established for public review and comment. Public notice of public involvement activities and time established for public review and comments on the TIP will satisfy the program of projects (POP) requirements.

The public discussion of the TIP at Old Colony Joint Transportation Committee (JTC), Old Colony MPO, and transportation meetings satisfies the Program of Projects (POP) public hearing requirements of the FTA. A public meeting of the Old Colony JTC is scheduled for August 2, 2018 at 12 PM. Furthermore, a public meeting of the Old Colony MPO is scheduled for August 21, 2018 at 10 AM to hear additional public comments and consider endorsement.

Please contact Charles Kilmer at 508-583-1833 Extension 206 for further information. Please send written comments to: Charles Kilmer c/o Old Colony Planning Council, 70 School Street, Brockton, MA 02301.



EMPLOYMENT

Help Wanted

Wood Component Assembler
Manufacturing plant needs employees to setup lumber for trusses and wall panels on an assembly table. Knowledge of lumber products and wood construction very helpful. Excellent benefit package.

Please apply at 200 Welby Rd. New Bedford Ma 02745

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Society, FSB, as Trustee for Stanwich Mortgage Loan Trust A

claiming to be the holder of mortgage covering real property situated in Quincy, MA, at 17-19 Des Road, given by Amy L. Conrad and Kristen Conrad to Mortgage Electronic Registration Systems, Inc. ("MERS") as nominee for Countrywide Home Loans, Inc. dated April 29, 2003, and recorded with the Norfolk County Registry of Deeds, Book 18778, Page 41 was filed with said court a bill in equity for authority to foreclose said mortgage in the manner following: by entry to foreclose and by exercise of power of sale set forth in said mortgage.

If you are entitled to the benefits of the Soldiers' and Sailors' Civil Relief Act of 1940 as amended, and you object to such foreclosure, you or your attorney should file a written appearance and answer in said court at Dedham on or before August 21, 2018, or you may be forever barred from claiming that such foreclosure is invalid under said act.

Witness Judith Fabricant, Esquire at Dedham the 3rd day of July in the year of our Lord two thousand and eighteen.

Walter E. Timity, Clerk
13706706 7/17/18

regarding the administration directly from the Personal Representative and may petition the Court in any matter relating to the estate, including the distribution of assets and expenses of administration.

WITNESS, Hon. John D. Casey First Justice of this Court.

Date: June 18, 2018

Patrick W. McDermott
Register of Probate

Ledger 7/17/2018
CN13705616

LEGAL NOTICE
To be auctioned off at Sunset Towing on 7/18/18

One Volkswagen Golf VLN.
WWWDH21.8Y1W740387

Pursuant to MGL C.255, S. 38A

Enterprise
7/3, 10 & 17, 2018
CN13701829

LEGAL NOTICE

According to law all overdue pledges of Rogers Jewelry's Loan Division will be sold at public auction July 27th, 2018 at 9:30 a.m. at 1402 Hancock Street Quincy MA

Ledger 13705576
7/10 & 17, 2018

Quincy, MA 01845 within thirty (30) days from the date of sale. Deed will be provided to purchaser for recording upon receipt in full of the purchase price. In the event of an error in this publication, the description of the premises contained in said mortgage shall control.

Other terms, if any, to be announced at the sale.

Wilmington Savings Fund Society, FSB D/B/A Christiana Trust, Not Individually but as Trustee for Hilldale Trust

Present Holder of said mortgage
By its attorneys,
WCG Law Group, PLLC
21 High Street, Suite 208B

North Ancover, MA 01845
Left, Addam and Lett, Deborah G.; 1612-FAY-1004; July 17, 2018, July 24, 2018, July 31, 2018

Enterprise 7/17, 24, 31, 2018
CN13705682

Restoration of Wetland

Southfield Redevelopment Authority
Conservation Commission

In accordance with Section 2.1(E) of the Zoning and Land Use By-Laws for NAS South Weymouth, and pursuant to M.G.L. Chapter 131, Section 40 (The Wetlands Protection Act), the Southfield Redevelopment Authority will hold a PUBLIC HEARING at 223 Shea Memorial Drive, South Weymouth, Massachusetts, on Wednesday, August 1, 2018 at 7:00 PM regarding the Conservation Commission's consideration of a Notice of intent filed by Dorset Park LLC for the restoration of an approximately 1,410 square foot area within a Bordering Vegetated Wetland. The project is located within a portion of Block 587, Lot 2 shown on Sheet 54 of the Assessors Map of the Town of Weymouth. A copy of the Notice of Intent is available for viewing at the offices of the Southfield Redevelopment Authority located at 223 Shea Memorial Drive, South Weymouth, Massachusetts.

Office Hours are 8:30 AM to 4:30 PM.
(781-882-2187)
Lyndsey M. Kruxer, Chairman
Southfield Redevelopment Authority

CN13708217
Patriot Ledger 7/17, 24

2016 Regional Transportation Plan

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD

2016 REGIONAL TRANSPORTATION PLAN (RTP) AMENDMENT 1

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CN13707983
Enterprise, Patriot Ledger 7/17/18

any to be announced at the sale. Dated: June 18, 2018 U.S. Bank, N.A., successor trustee to Bank of America, N.A., successor in interest to LaSalle Bank N.A. as Trustee, on behalf of the holders of the Washington Mutual Mortgage Pass-Through Certificates, WMALT Series 2006-7 By its Attorney DOONAN, GRAVES & LONGCRIA, LLC, 100 Cummings Center, Suite 225D, Beverly, MA 01915 (978) 921-2670 www.dgandl.com 4013.09 (JORDAN, JR.)

13704063 7/3,10,17, 2018
1305 Hancock Street
Meeting

NOTICE OF PUBLIC HEARING

In accordance with the provisions of MGL Ch. 131, SEC. 40, The Wetlands Protection Act and the Quincy Wetlands Protections Ordinance, The Quincy Conservation Commission will hold a public hearing on Wednesday @7:30 P.M. on August 1, 2018 in the Meeting Room, First floor, 1305 Hancock Street, Quincy, MA 02169 TO CONSIDER A Notice of Intent filed by: Edmund Yu, E.Y. Realty, LLC to construct a two unit residential building at 184 Billings Rd. in Quincy, MA 02171.

Plans and specifications can be reviewed at the Building Department, 55 Sea Street, Quincy, MA 02169

CN13709086
Patriot Ledger 7/8/18

LEGAL NOTICE
To be auctioned off at Sunset Towing on 7/18/18

One Jeep Grand Cherokee VLN.
1J4GW48683C593470

Pursuant to MGL C.255, S. 38A

Enterprise
7/3, 10 & 17, 2018
CN13701824

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PUBLIC COMMENTS

Date	Name	Representation	Comment Summary	Response
8/2/2018	Old Colony Joint Transportation Committee (JTC)	Old Colony Region	The Old Colony Joint Transportation Committee, at its public meeting on August 2, 2018, reviewed and approved the 2016 Old Colony Regional Transportation Plan (RTP) Amendment 1.	Noted.

Comments as of Close of Business (COB) August 16, 2018