Montachusett Metropolitan Planning Organization

Regional Transportation Plan 2020

MPO ENDORSED

July 17, 2019

Working Towards the Future

Montachusett Regional Planning Commission

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

MONTACHUSETT

REGIONAL PLANNING COMMISSION

Offices: 464 Abbott Avenue., Leominster, Massachusetts 01453
(978) 345-7376 Fax: (978) 348-2490

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

MONTACHUSETT METROPOLITAN PLANNING ORGANIZATION ENDORSEMENT OF THE 2020 REGIONAL TRANSPORTATION PLAN

In accordance with 23 CFR Part 450 Section 322 (Development and content of the Metropolitan Transportation Plan) of the March 16, 2007 Final Rules for Statewide and Metropolitan Planning, the Montachusett Metropolitan Planning Organization (MPO) for the Montachusett Region hereby endorses the 2020 Montachusett Regional Transportation Plan (RTP).

7-17-19
Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation

for 7-17-19
Jonathan Gulliver, Administrator
Massachusetts Department of Transportation, Highway Division

John A. Telepchak, Chairman
Montachusett Regional Planning Commission

Dean Mazzarella, Chairman
Montachusett Regional Transit Authority

Guy Corbosiero
Mark Hawke, Mayor
City of Gardner

Stephen DiNatale, Mayor
City of Fitchburg

Tracy Murphy
Barbara Anderson, Selectmen, Town of Winchendon
Representative, Sub Region 1

Rosemarie Meissner, Selectmen, Town of Ashburnham
Representative, Sub Region 2

Timothy B. Kilhart
Phyllis Luck, Selectmen, Town of Lunenburg
Representative, Sub Region 3

Stanley B. Starr, Jr., Selectmen, Town of Lancaster
Representative, Sub Region 4

7/17/19
Date

MONTACHUSETT

REGIONAL PLANNING COMMISSION
Offices: 464 Abbott Ave., Leominster, Massachusetts 01453
(978) 345-7376 Fax: (978) 348-2490

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

310 CMR 60.05: Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation

Self-Certification Compliance Statement for Metropolitan Planning Organizations

This will certify that the Transportation Improvement Program and Air Quality Conformity Determination for the Montachusett Metropolitan Planning Organization is in compliance with all applicable requirements in the State Regulation 310 CMR 60.05: Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation. The regulation requires the Metropolitan Planning Organizations (MPOs) to:

1. 310 CMR 60.05, 5(a)(1): Evaluate and report the aggregate transportation GHG emissions and impacts of RTPs and TIPs;
2. 310 CMR 60.05, 5(a)(2): In consultation with MassDOT, develop and utilize procedures to prioritize and select projects in RTPs and TIPs based on factors that include aggregate transportation GHG emissions impacts;
3. 310 CMR 60.05, 5(a)(3): Quantify net transportation GHG emissions impacts resulting from the projects in RTPs and TIPs and certify in a statement included with RTPs and TIPs pursuant to 23 CFR Part 450 that the MPO has made efforts to minimize aggregate transportation GHG emissions impacts.
4. 310 CMR 60.05, 5(a)(4): Determine in consultation with the RPA that the appropriate planning assumptions used for transportation GHG emissions modeling are consistent with local land use policies, or that local authorities have made documented and credible commitments to establishing such consistency;
5. 310 CMR 60.05, 8(a)(2)(a): Develop RTPs and TIPs;
6. 310 CMR 60.05, 8(a)(2)(b): Ensure that RPAs are using appropriate planning assumptions;
7. 310 CMR 60.05, 8(a)(2)(c): Perform regional aggregate transportation GHG emissions analysis of RTPs and TIPs;
8. 310 CMR 60.05, 8(a)(2)(d): Calculate aggregate transportation GHG emissions for RTPs and TIPs;
9. 310 CMR 60.05, 8(a)(2)(e): Develop public consultation procedures for aggregate transportation GHG reporting and related GWSA requirements consistent with current and approved regional public participation plans;
10. 310 CMR 60.05, 8(c): Prior to making final endorsements on the RTPs, TIPs, STIPs, and projects included in these plans, MassDOT and the MPOs shall include the aggregate transportation GHG emission impact assessment in RTPs, TIPs, and STIPs and provide an opportunity for public review and comment on the RTPs, TIPs, and STIPs.
11. 310 CMR 60.05, 8(a)(1)(c): After a final GHG assessment has been made by MassDOT and the MPOs, MassDOT and the MPOs shall submit MPO-endorsed RTPs, TIPs or projects within 30 days of endorsement to the Department for review of the GHG assessment.

7-17-19

Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation

for 7-17-19

Jonathan Gulliver, Administrator
Massachusetts Department of Transportation, Highway Division

The signatures of the other MPO signatories can be found on the following page.

310 CMR 60.05: Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation

Montachusett MPO Signatories

Guy Corbosiero, Chairman
Montachusett Regional Planning Commission

Dean Mazzarella, Chairman
Montachusett Regional Transit Authority

Mark Hawke, Mayor
City of Gardner

Stephen DiNatale, Mayor
City of Fitchburg

Barbara Anderson, Selectmen, Town of Winchendon
Representative, Sub Region 1

Rosemarie Meissner, Selectmen, Town of Ashburnham
Representative, Sub Region 2

Phyllis Luck, Selectmen, Town of Lunenburg
Representative, Sub Region 3

Stanley B. Starr, Jr., Selectmen, Town of Lancaster
Representative, Sub Region 4

7/17/19
Date

Notice of Nondiscrimination Rights and Protections to Beneficiaries

Federal "Title VI/Nondiscrimination" Protections

The Montachusett Regional Planning Commission (MRPC) 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 administrated 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 MRPC's Title VI Programs consistent with federal interpretation and administration. Additionally, MRPC 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.

State Nondiscrimination Protections

MRPC 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, MRPC 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.

Additional Information

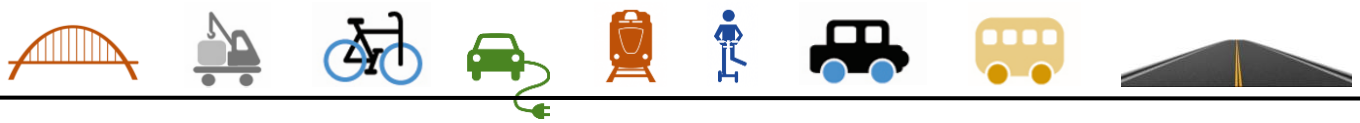
To request additional information regarding Title VI and related federal and state nondiscrimination obligations, please contact:

Montachusett Metropolitan Planning Organization (MMPO)
and Montachusett Regional Planning Commission (MRPC)
Title VI Coordinator
MRPC
464 Abbott Ave.
Leominster, MA 01453
(978) 345-7376
geaton@mrpc.org

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



Language Assistance

English: If this information is needed in another language, please contact the MRPC Title VI Coordinator at 978-345-7376.

Spanish: Si necesita esta información en otro idioma, por favor contacte el coordenador del MRPC del Título VI al 978-345-7376.

Portuguese: Caso esta informação seja necessária em outro idioma, favor contar o Coordenador em Título VI do MRPC pelo telefone 978-345-7376.

French: Si cette information est nécessaire dans une autre langue, s'il vous plaît communiquer avec le coordonnateur MRPC Titre VI au 978-345-7376.

MONTACHUSETT METROPOLITAN PLANNING ORGANIZATION SIGNATORIES	
Massachusetts Department of Transportation (MassDOT) Secretary	Stephanie Pollack
MassDOT Highway Division Administrator	Jonathan L. Gulliver
Montachusett Regional Planning Commission (MRPC) Chairman	John C. Telepciak
Montachusett Regional Transit Authority (MART) Chairman	Mayor Dean Mazzarella
Mayor City of Gardner	Mayor Mark Hawke
Mayor City of Fitchburg	Mayor Stephen DiNatale
Winchendon Board of Selectmen *Subregion 1*	Barbara Anderson
Ashburnham Board of Selectmen *Subregion 2*	Rosemarie Meissner
Lunenburg Board of Selectmen *Subregion 3*	Phyllis Luck
Lancaster Board of Selectmen *Subregion 4*	Stanley B. Starr, Jr.

MPO SUB-SIGNATORY COMMITTEE MEMBERS
David Mohler, Director OTP, MassDOT, for Secretary Stephanie Pollack
Arthur Frost, Project Development Engineer for Administrator Jonathan L. Gulliver
Glenn Eaton, Executive Director, MRPC, for Chairman John Telepciak
Mohammed H. Khan, Administrator, MART, for Chairman Mayor Dean Mazzarella

EXOFFICIO MEMBERS	
Jeffrey H. McEwen, Administrator	Federal Highway Administration
Mary Beth Mello, Administrator	Federal Transit Administration

MONTACHUSETT REGIONAL PLANNING COMMISSION (MRPC) OFFICERS	
Guy Corbosiero, Chairman	Winchendon
John Telepciak, Vice Chairman	Phillipston
Laura Shifrin, Secretary	Townsend
Alan Pease, Treasurer	Ashby
Roger Hoyt, Asst. Treasurer	Ashburnham

MONTACHUSETT JOINT TRANSPORTATION COMMITTEE (MJTC) OFFICERS	
Jon Wyman, Chairman	Westminster
Paula Bertram, Vice Chairman	Lunenburg
Doug Walsh, Secretary	Athol

MONTACHUSETT REGIONAL PLANNING COMMISSION STAFF
Glenn Eaton, Executive Director
Linda Parmenter, Administrative/Human Resources Director
Linda Quinlivan, Fiscal Manager
Holly Ford, Executive Assistant
Brad Harris, Transportation Director
George Snow, Principal Transportation Planner
Sheri Bean, Principal Planner
Brian Doherty, Principal Transportation Planner
George Kahale, Transit Director
John Hume, Planning and Development Director
Karen Chapman, Principal Planner
Sean O'Donnell, Regional Planner
Kayla Kress, GIS Technician

MONTACHUSETT JOINT TRANSPORTATION COMMITTEE

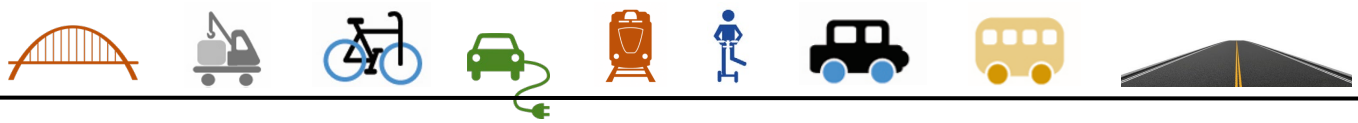
COMMUNITY	APPOINTED BY SELECTMEN/MAYOR	APPOINTED BY PLANNING BOARD
Ashburnham	Jessica Caouette	Richard Wright
Ashby		Alan Pease
Athol	Doug Walsh	Doug Walsh
Ayer		Mark Archambault
Clinton	Phil Duffy	
Fitchburg		Paula Caron
Gardner	Treavor Beauregard	
Groton		Russell Burke
Harvard		Erin McBee
Hubbardston	Travis Brown	
Lancaster	Noreen Piazza	
Leominster	David DiGiovanni	
Lunenburg	Paula Bertram	Kenneth Chenis
Petersham	Nancy Allen	
Phillipston	Gordon Robertson	
Royalston	Roland Hamel	
Shirley		Bonnie Lawrence
Sterling	John Kilcoyne	Michael Pineo
Templeton	Eric Pollitt	Charles Carroll II
Townsend		
Westminster		Jon Wyman
Winchendon	Keith Hickey	Tracy Murphy

EXOFFICIO MEMBERS

	Office of Transportation Planning (OTP) and
Bryan Pounds	Massachusetts Department of Transportation (MassDOT)
Jeffrey H. McEwen	Federal Highway Administration (FHWA), Administrator
Mary Beth Mello	Federal Transit Administration (FTA), Administrator
	Department of Environmental Protection (DEP)
Jeffery Hoynoski	MassDOT Highway Division - District 2
Arthur Frost	MassDOT Highway Division - District 3
	Montachusett Regional Planning Commission (MRPC)
Mohammed Khan	Montachusett Regional Transit Authority (MART)

ORGANIZATION MEMBERS

Al Futterman	Nashua River Watershed Association (NRWA)
Tony Salerno	Amalgamated Transit Union #690 (ATU 690)
Kit Walker	Fitchburg Airport Commission
	North Central MA Chamber of Commerce
	Fitchburg Council on Aging
	Mass Development
Peter Lowitt	Devens Enterprise Commission (DEC)
Patricia Pistone	Montachusett Opportunity Council, Inc.
	The ARC of Opportunity



Executive Summary

EXECUTIVE SUMMARY

Transportation in the Montachusett Region ranges from rural highways connecting small towns, to urban streetscapes and cities connected by major highways and arterials. Public transit on local, regional and statewide scales exist, as do major corridors where freight travels within and across our region to areas nationwide. Inhabitants of the region rely on this vast network to access jobs and recreation in the Montachusett region and beyond. The infrastructure that exists and the needs for our future develop a vision for transportation in the Montachusett region ***"Working Towards the Future"*** to 2040.

What is the RTP

The 2020 Regional Transportation Plan (RTP) serves as a long-term blueprint of the region's transportation system. The current network is compared to the past and envisioned 25 years into the future. Needs are identified and a framework of projects and priorities are set across all modes, i.e. highway, transit, bicycle and pedestrian, freight, etc. The RTP also serves to provide as a basis for any federally financed transportation and transit project, program or study.

Background

The Montachusett Region was settled as early as the 17th Century and began as small settlements that moved from an era of agrarianism into the age of industrialization and now into the era of information and communications. The region's landscape varies from urban centers with a strong presence of mixed-uses (commercial, housing and in some cases industry) with well-established neighborhoods to small, sparsely populated rural communities containing "town commons".

Goals, Objectives and Performance Measures

Moving Ahead for Progress in the 21st Century (MAP-21) requires Performance Measures to inform and improve the MPO decision making process. Performance measures (PMs) are set to achieve a desired set of performance outcomes for a multimodal transportation network. After an MPO develops their set of performance outcomes, the PMs are used to track the performance of the outcomes over time to determine the progress in meeting them. This tracking occurs through the ongoing data collection and planning activities of the MRPC. The development and tracking of PMs allows the MRPC to identify the areas that additional emphasis through TIP projects may be necessary to achieve a safe and dependable regional multimodal transportation network.

Vision Statement

> *"The Montachusett Metropolitan Planning Organization seeks to provide a multi-modal transportation system that is safe, secure, efficient and affordable to all individuals while maintaining support and encouragement for economic development, growth and revitalization while simultaneously promoting a sustainable, healthy, livable and environmentally sensitive region."*

Goals

The RTP is built on a performance-based planning approach with a vision statement, goals, objectives and performance measures. Goals were made and specific objectives were identified in the areas of:

- Goal 1 – Improve and Maintain Safety and Security
- Goal 2 – Reduce Congestion and Improve Mobility
- Goal 3 – Promote and Seek Equitable Transportation for All

- Goal 4 – Improve System Preservation and Maintenance of All Modes
- Goal 5 – Improve Economic Vitality
- Goal 6 – Improve and Promote Healthy Modes and Transportation Options
- Goal 7 – Reduce Green House Gas and Promote Environmental Practices and Sustainability

Regional Profile

This chapter attempts to paint an overall picture of the region and its inhabitants. Various demographic data is compiled and trends are examined to see how the region is developing. From this analysis, the needs or impacts to the transportation systems are considered and certain trends and recommendations and/or policies are put forward.

Great Wolf Lodge, Fitchburg

Also included in this chapter are projections for the region in terms of population, employment and housing. These projections were developed by MassDOT in coordination with the MPO and MRPC.

Infrastructure and Congestion

This chapter reports existing conditions on pavement and bridge infrastructure in the region. Comparisons are made to the condition of infrastructure from the previous RTP and recommendations are made going forward.

The Congestion chapter focuses on what are considered the most congested roadways and corridors in the region as well as congestion related projects and studies done since the last RTP.

Table ES-1

Population & Projections for the Montachusett Region

TOWN	COUNTY	Census 2000	Census 2010	2020	2030	2040	% Change '10-'20	% Change '20-'30	% Change '30-'40	% Change '10-'40
Ashburnham	Worcester	5,546	6,081	6,142	6,250	6,195	1.00%	1.76%	-0.88%	1.87%
Ashby	Middlesex	2,845	3,074	3,111	3,166	3,138	1.20%	1.77%	-0.88%	2.08%
Athol	Worcester	11,299	11,584	12,185	12,399	12,290	5.19%	1.76%	-0.88%	6.09%
Ayer	Middlesex	7,287	7,427	7,578	7,712	7,644	2.03%	1.77%	-0.88%	2.92%
Clinton	Worcester	13,435	13,606	13,848	13,732	13,351	1.78%	-0.84%	-2.77%	-1.87%
Fitchburg	Worcester	39,102	40,318	42,640	43,391	43,007	5.76%	1.76%	-0.88%	6.67%
Gardner	Worcester	20,770	20,228	21,639	22,021	21,200	6.98%	1.77%	-3.73%	4.81%
Groton	Middlesex	9,547	10,646	11,340	12,090	12,773	6.52%	6.61%	5.65%	19.98%
Harvard	Worcester	5,981	6,520	7,439	8,869	9,250	14.10%	19.22%	4.30%	41.87%
Hubbardston	Worcester	3,909	4,382	4,777	5,232	5,497	9.01%	9.52%	5.06%	25.45%
Lancaster	Worcester	7,380	8,055	8,025	8,166	8,094	-0.37%	1.76%	-0.88%	0.48%
Leominster	Worcester	41,303	40,759	40,577	40,046	40,300	-0.45%	-1.31%	0.63%	-1.13%
Lunenburg	Worcester	9,401	10,086	10,275	10,456	10,364	1.87%	1.76%	-0.88%	2.76%
Petersham	Worcester	1,180	1,234	1,270	1,293	1,281	2.92%	1.81%	-0.93%	3.81%
Phillipston	Worcester	1,621	1,682	1,723	1,697	1,628	2.44%	-1.51%	-4.07%	-3.21%
Royalston	Worcester	1,254	1,258	1,223	1,210	1,125	-2.78%	-1.06%	-7.02%	-10.57%
Shirley	Middlesex	6,373	7,211	6,989	7,112	7,049	-3.08%	1.76%	-0.89%	-2.25%
Sterling	Worcester	7,257	7,808	7,817	7,746	7,108	0.12%	-0.91%	-8.24%	-8.97%
Templeton	Worcester	6,799	8,013	7,766	7,903	7,833	-3.08%	1.76%	-0.89%	-2.25%
Townsend	Middlesex	9,198	8,926	8,970	8,606	8,350	0.49%	-4.06%	-2.97%	-6.45%
Westminster	Worcester	6,907	7,277	7,457	7,607	7,420	2.47%	2.01%	-2.46%	1.97%
Winchendon	Worcester	9,611	10,300	10,816	11,195	10,808	5.01%	3.50%	-3.46%	4.93%
REGION		***228,005***	***236,475***	***243,607***	***247,899***	***245,705***	***3.02%***	***1.76%***	***-0.89%***	***3.90%***
Massachusetts		**6,349,097**	**6,547,629**	**6,933,887**	**7,225,472**	**7,380,399**	**5.90%**	**4.21%**	**2.14%**	**12.72%**

Equity

Complying with Title VI and Environmental Justice regulations is important to the MPO as well as to the overall transportation planning process. It ensures participation from all populations in order to address individual needs and requirements. Equity is a civil and human rights priority and major goal for the Montachusett Region. It requires making investments that provide all residents - regardless of age, race, color, national origin, income or physical agility - with opportunities to work, shop, be healthy, and play.

Towards that end, this RTP conducted a review/analysis of the identified populations within the region versus the implementation of past projects and future projects or recommendations in order to assess any undo benefit or burden. The resulting review indicated that these populations were not subject to underfunding in terms of projects or recommendations. Additionally, the projects identified consisted mainly of repair/replacement of existing infrastructure and where new systems such as trails were identified they did not adversely impact a particular population but would instead prove helpful to the demographic.

Economic Vitality

The MRPC is committed to the goal of improving economic vitality in the Montachusett Region by focusing on improving the transportation infrastructure that services the diverse economic drivers within the Region. The *Economic Vitality Needs* dialog below provides a snapshot of the existing transportation infrastructure critical to the economic vitality of the Montachusett Region that should be the focus of future improvement.

Bicycle & Pedestrian

Increasing concern for air quality, energy conservation, rising fuel costs, and the health benefits of getting outdoors is leading to renewed interest in multi-modal transportation

in the Montachusett Region and throughout the state. The MRPC has been working toward a more sustainable transportation system by educating and promoting transportation mode choice throughout the region. This chapter examines

and reviews existing and proposed Bicycle and Pedestrian transportation options while focusing on the importance of mode shift.

Safety

This chapter uses the Massachusetts Strategic Highway Safety Plan Update Focus and the Montachusett Region All Mode High Crash Locations Focus as an approach to improving safety in the region. A five-year lookback on crashes reveals the high crash locations and the trends associated with this type of data. Locations where there have been safety improvements have proved to have a significant reduction in crashes. It is recommended that future safety studies be conducted on the updated high crash location list.

Transit

This chapter presents a review of the state of the current transit network operating in the region from bus to commuter rail. Public outreach comments were significant and plentiful when related to transit. Many opportunities exist to expand and improve the system. Several recommendations are included to try to meet the various Challenges identified but as is often the case funding plays a major role in what can be implemented.

Environment and Climate Change

This chapter seeks explains the effect of the environment and possible effects of climate change have as applied to the transportation system in the region. Environment and climate change related programs, studies and initiatives are highlighted that can help the state meet its Green House Gas reduction goals.

Public Input

An important element of the development process for the RTP is public outreach and involvement. Towards this end, the MRPC utilized several public meetings as well as an online survey and interactive mapping component in an effort to solicit feedback on the needs and issues facing the region's transportation network.

Meetings were held as follows:

- Fitchburg/Leominster at MART Facility
- Harvard Town Hall
- Ayer Town Hall
- Phillipston Public Safety Building
- Winchendon Beals Memorial Library
- Montachusett Regional Trails Coalition meeting at MRPC

Additionally, a survey was produced to solicit general opinions regarding the transportation systems and areas of need and emphasis. Two hundred and three respondents provided feedback that combined with the comments made at the public outreach meetings helped to expand, clarify and form the objectives of the identified goals.

Planning Scenarios

Based off of the work that the Commission on the Future of Transportation in the Commonwealth recently completed, staff developed scenarios based on the general concepts put forward by the Commission but more applicable to the region's trends and communities. These scenarios include Status Quo, Multiple Hubs and Strong Community Centers. These scenarios were established to assist communities with how to meet their future demands. Action related to the advancement of these scenarios would occur as part of the project development process by the municipalities and within the TIP prioritization and development process.

Financial Analysis

A major requirement of the RTP is that it be fiscally constrained over its 20-year life span. To achieve this, funding estimates are provided by MassDOT and the MPO estimates the fiscal impact of the project needs and recommendations identified in the RTP. Transit and Highway estimates are compared to anticipated funding levels to establish this fiscal constraint. Within this RTP, fiscal constraint was achieved. However, it should be noted that the potential readily exists for the needs to outstrip the funding available if continued monitoring of the various systems is not maintained.

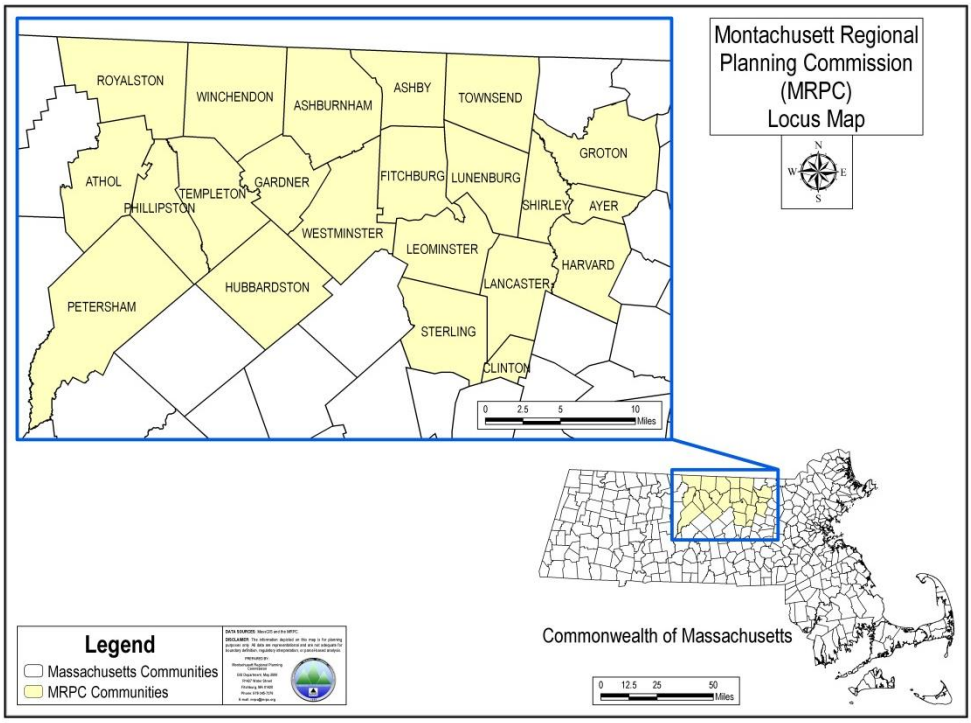
Conclusion

Working Towards the Future attempts to be a blueprint for the region to achieve a multi-modal transportation system that balances the varying needs of its population within the fiscal projections provided.

1 Introduction

INTRODUCTION

Working Toward the Future is the long-range transportation plan (RTP) developed by the Montachusett Metropolitan Planning Organization (MPO. The RTP is an assessment of the multi-modal transportation network within the Montachusett planning region, its needs now and in the future, the resources available and the projects and policies, both state and federal, which will guide the region over the next 20 years to 2040. The development of this plan has followed a robust outreach program of public meetings and surveys in an effort to solicit local input and guidance on topics of performance measures, areas of concern, possible projects and prioritization.



Montachusett Metropolitan Planning Organization (MMPO)

All urbanized areas with a population greater than 50,000 are required by the U.S. Department of Transportation (USDOT) Federal regulations to designate an MPO for the area. The

establishment of an MPO is necessary for the State to receive Federal transportation funds. The Montachusett MPO region is situated in north central Massachusetts and includes 3 cities and 19 towns covering approximately 685 square miles. Overall, the population of the region in 2017 was 242,671 according to the American Community Survey. Route 2 runs east-west throughout the region and serves as the second major east-west highway in the Commonwealth. In the Montachusett Region, the Montachusett Regional Planning Commission (MRPC) serves as staff for the MPO.

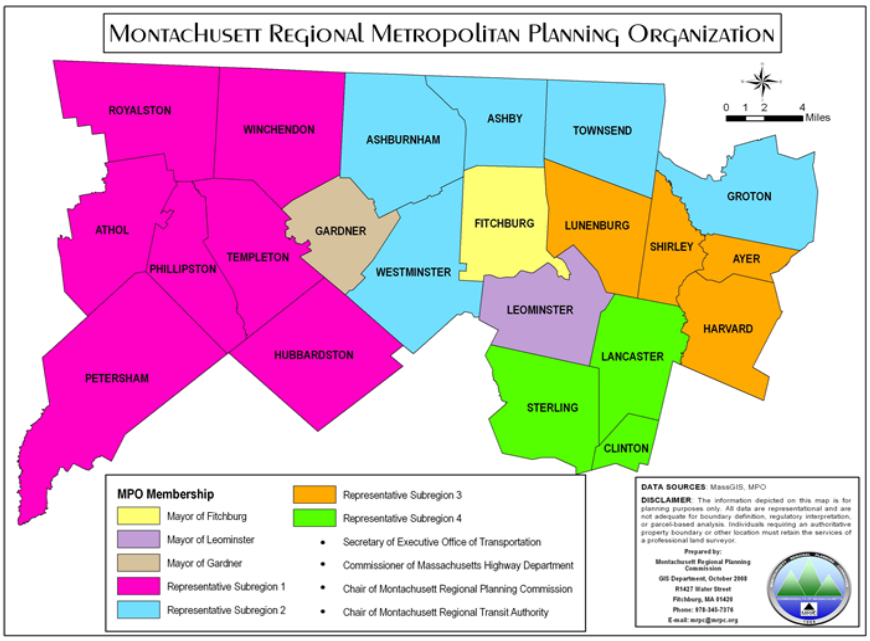
The MPO is currently comprised of the following signatories:

- Secretary and CEO of the Massachusetts Department of Transportation (MassDOT);
- Administrator of MassDOT Highway Division
- Chairman of the MRPC,
- Chairman of the Montachusett Regional Transit Authority (MART),
- Mayor of Fitchburg,
- Mayor of Leominster
- Mayor of Gardner
- One Selectman from Subregion 1, 2, 3, and 4

The 19 rural communities have been grouped into one of these four geographically defined sub Regions:

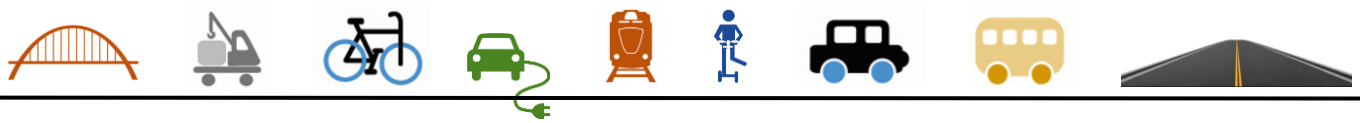
- Subregion 1) Athol, Hubbardston, Petersham, Phillipston, Royalston, Templeton, and Winchendon;
- Subregion 2) Ashburnham, Ashby, Groton, Townsend, and Westminster;
- Subregion 3) Ayer, Harvard, Lunenburg and Shirley; and
- Subregion 4) Clinton, Lancaster, and Sterling.

These members serve as the MPO Policy Board that seeks to ensure a comprehensive, cooperative, and continuing (3C) transportation planning process in the Leominster - Fitchburg Urbanized Area and the Montachusett Region.



Montachusett Joint Transportation Committee

As part of the outreach and local participation process, a special advisory committee known as the Montachusett Joint Transportation Committee (MJTC) serves as the Transportation Policy Advisory Group for the Region. The principal mission of the MJTC is to foster broad and robust participation in the transportation planning process by maintaining a forum that brings together representatives of cities and towns, citizens concerned with the transportation planning process, other public agencies, and transportation providers, thereby facilitating, wherever possible, the consistency of transportation plans and programs for the Region with the policies, priorities, and plans of affected state and regional agencies, local communities, private groups and individuals within the region. Membership in the MJTC is comprised of locally appointed representatives (one designated by the community planning board and one by the Chief Elected Official) as well as representatives of area organizations or agencies. The MJTC strives to be as inclusive as possible and regularly encourages those groups wishing to be part of the process to formally request membership. The MJTC also participates in all Montachusett MPO meetings and has the opportunity to, whenever possible, review, comment and advise the MPO on matters being discussed.



Planning Documents and the MPO

The Regional Transportation Plan provides the basic framework for implementing future short-range and long-range transportation and air quality improvements in the Montachusett Region. In addition, it sets the basic transportation goals and objectives for the region. In addition to the RTP, the MRPC staff annually produces a Transportation Improvement Program (TIP) and Unified Planning Work Program (UPWP). The UPWP is a financial programming tool developed annually as part of the federally certified transportation planning process. This document contains task descriptions of the transportation-planning program of the MPO, with associated budget information and funding sources for the program year.

The TIP is a prioritized listing of transportation projects proposed for implementation during the future five federal fiscal years. TIP projects are identified by funding category so that where necessary priorities may be established for projects within each funding program.

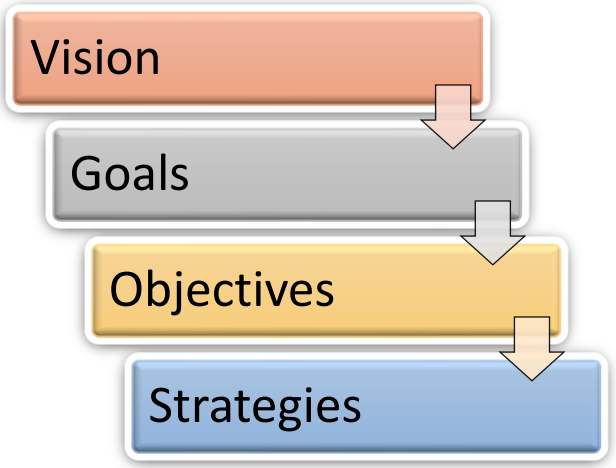
2 Vision, Goals, Objectives & Strategies

VISION, GOALS, OBJECTIVES AND STRATEGIES

In order to inform, guide and improve the MPO decision making process, the development of a Vision Statement and a series of Goals, Objectives and Strategies (GO&S) was undertaken. These updated statements were based on the prior Regional Transportation Plan and refined over a series of meetings and discussions with the MPO, members of the Montachusett Joint Transportation Committee (MJTC) and the general public. The establishment of these GO&S help to define and guide the scenarios, analysis and recommendations that encompass this RTP.

Vision Statement

"The Montachusett Metropolitan Planning Organization seeks to provide a multi-modal transportation system that is safe, secure, efficient and affordable to all individuals while maintaining support and encouragement for economic development, growth and revitalization while simultaneously promoting a sustainable, healthy, livable and environmentally sensitive region."



Goals, Objectives and Strategies

Goal 1 – Improve and Maintain Safety and Security

Objectives

i. Reduce the number and severity of vehicular crashes within the region across all modes.

Strategies

- Promote and identify projects that are designed to address high crash locations and prioritize their implementation.
- Promote and encourage education outreach programs to drivers, pedestrians and bicyclists regarding rules and responsibilities.

- Encourage community involvement with federal and state programs and education initiatives such as Safe Routes to School.
- Seek to improve user awareness along all transportation networks through better identification, pavement markings and signage with an emphasis on bicycle and pedestrian routes.
- Seek to expand the number and use of variable message signs along major roads such as Route 2 and I-190 to inform drivers of potential unsafe conditions and important alerts.

ii. Improve access and mobility along identified emergency and evacuation routes in the Region.

Strategies

- Promote projects that address key identified emergency and evacuation routes in order to maintain effectiveness.

Goal 2 – Reduce Congestion and Improve Mobility

Objectives

i. Monitor and promote and identify projects that address congested roadways within the Region.

Strategies

- Support programs that efficiently address deficiencies across all modes including freight and rail locations.

ii. Increase travel options within the region through the promotion of trails, Complete Streets, transit, land use and their interactions.

Strategies

- Encourage communities to address local mobility issues in order to promote mode shift options in congested areas.

Goal 3 – Promote and Seek Equitable Transportation for All

Objectives

i. Increase access to transit options through improved dissemination of available service information.

Strategies

- Improve outreach and partnerships between RTA's and social service agencies, schools, health centers, neighborhood organizations, etc.
- Actively seek and identify organizations and agencies of Title VI and Environmental

Justice populations and conduct direct outreach to encourage involvement and participation in the planning process.

ii. Improve transit service operations for all trip destinations/purposes and users.

Strategies

- Promote the development of improvements and options across all modes for areas that serve Title VI and Environmental Justice populations.
- Monitor fee options in order to maintain equitability for all users.

Goal 4 – Improve System Preservation and Maintenance for All Modes

Objectives

i. Support and prioritize preservation projects in order to maintain a state of good repair for all modes.

Strategies

- Continue to monitor, and revise as needed, the Transportation Evaluation Criteria (TEC) to promote those projects that help to maintain a state of good repair.
- Monitor overall conditions of infrastructure elements including pavement, sidewalks, drainage, stormwater, culverts, bridges and others in the region and support improvement efforts.
- Encourage communities to maintain trails that provide transportation options throughout the year.
- Support continued operation, maintenance, state of good repair and improvement of the transit system.

ii. Encourage communities to seek funding and implementation of projects through the Transportation Improvement Program (TIP) process as well as other applicable federal and state programs.

Strategies

- Encourage additional funds for the maintenance and preservation of all aspects of the transportation network in the region.

Goal 5 – Improve Economic Vitality

Objectives

i. Promote the economic advantages of the region across all modes.

Strategies

- Establish and prioritize major trail connections for commuter and recreational purposes throughout the region and beyond.
- Promote transit and commuter rail options.
- Improve railroad and other restricted bridges in order to enhance freight mobility.
- Improve freight and general vehicle access and connection to Route 2 and other major highways across the region.
- Improve access to job clusters and employment centers and economic development priority areas.

Goal 6 – Improve and Promote Heathy Modes and Transportation Options

Objectives

i. Expand travel options and modes across the region through improved connections and services.

Strategies

- Improve and maintain infrastructure and bicycle/pedestrian facilities for transit centers and transit vehicles, as well as at other applicable public and commercial facilities/locations, to encourage commuter options and increased usage of healthy travel modes.
- Promote programs related to Complete Streets, Safe Routes to School (SRTS), trail development, sidewalks and ADA mobility improvements.
- Promote and encourage a shift from single occupant vehicles to transit, bicycle and pedestrian modes through improved transit, van/car pool and trail options.
- Promote and encourage small communities to examine and implement applicable programs such as ride share, sidewalk development and connections, etc. that would improve healthy travel options locally.

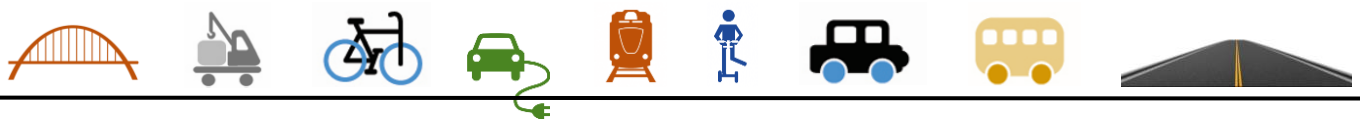
Goal 7 – Reduce Green House Gas and Promote Environmental Practices and Sustainability

Objectives

i. Reduce Greenhouse Gas emissions through support and implementation of all applicable state and federal programs and projects.

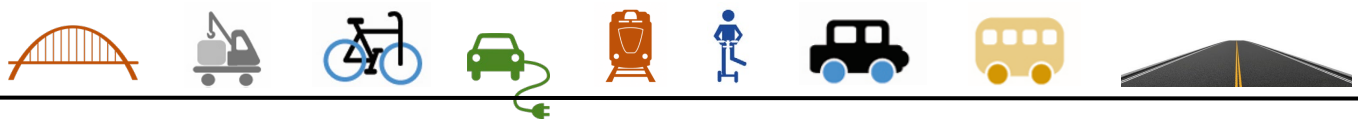
Strategies

- Prioritize vehicle replacement in the transit fleet with applicable and cost-effective alternative fuel vehicles.
- Encourage communities to promote and support Green Streets and other state and federal initiatives through Low Impact (LID), Transit Oriented (TOD) and Smart Growth Developments.
- Encourage and support the use of alternative fuel vehicles by the public with



infrastructure support services.

- Promote programs and projects that support the State Mode Shift Goals.
- Promote stormwater drainage improvements in order to meet state and federal guidelines.



3 Performance Measures

PERFORMANCE MEASURES

In December 2015, the Federal Surface Transportation Authorization known as Fixing America's Surface Transportation (FAST) Act passed into law. The FAST Act "largely maintains current structures and funding shares between highways and transit" and "makes changes and reforms to many Federal transportation programs, including streamlining the approval processes for new transportation projects, providing new safety tools, and establishing new programs to advance critical freight projects" (source: U. S. DOT website). The FAST Act retains most of the planning requirements of prior federal regulations, i.e. Moving Ahead for Progress in the 21st Century (MAP-21) and the Safe Accountable Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

The FAST Act added two additional factors to the eight planning factors for both metro and statewide planning identified in MAP-21:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency;
- Increase the safety of the transportation system for all motorized and non-motorized users;
- Increase the ability of the transportation system to support homeland security and to safeguard the personal security of motorized and non-motorized users;
- Increase accessibility and mobility of people and freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation;
- Emphasize the preservation of the existing transportation system;
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
- Enhance travel and tourism.

A key feature of the FAST Act legislation that is maintained from prior legislation "is the establishment of a performance- and outcome-based program. The objective…is for States to invest resources in projects that collectively will make progress toward the achievement of the national goals." National performance goals have been established in seven areas:

- Safety - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- Infrastructure condition - To maintain the highway infrastructure asset system in a state of good repair.
- Congestion reduction - To achieve a significant reduction in congestion on the National Highway System.
- System reliability - To improve the efficiency of the surface transportation system.
- Freight movement and economic vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- Reduced project delivery delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

Performance measures and targets are required to be established by FHWA, state DOTs, MPOs and other stakeholders in consultation with each other over the upcoming years. The Montachusett MPO is committed to working with MassDOT, FHWA and other partners to develop and track the performance of elements of the regional transportation system and to utilize these performance measures as a tool or guide in the transportation planning process.

Regional Transportation Plan – Performance Measures

MRPC staff has continued to review available data, information, state and federal goals and requirements in order to develop and expand regional local performance measures. A series of performance measures were identified during the development of the 2016 Regional Transportation Plan (RTP). These performance measures form the basis for system monitoring

in the Montachusett Region only. Additionally, the regional performance measures are incorporated into the decision-making process for the TIP and where applicable are linked to transportation investment decisions, i.e. the Transportation Evaluation Criteria (TEC). As these measures are further defined and reviewed by the MPO, it is expected that the TEC will also be revised and/or updated to reflect them. Data for the regional performance measures are derived from a combination of agency data collection efforts, studies and statewide databases made available to the MRPC.

The following tables outline the RTP defined Goals, Objectives and Performance Measures (PM) that address the seven National performance goals.

Regional Transportation Plan Goals, Objectives and Performance Measures Summary

Goal 1 – Improve and Maintain Safety and Security	
Objectives	**Performance Measures**
• Seek to reduce the number and severity of vehicular crashes within the region across all modes.	1. Reduce the Regional EPDO and percentage of fatal and injury crashes among vehicles, bicycles and pedestrians by 10% over a 10-year period.
• Promote projects that are designed to address high crash locations and prioritize their implementation.	2. Reduce the fatality rate by 10% and the serious injury rate by 10% from current levels in 10 years.
• Promote and encourage education outreach programs to drivers, pedestrians and bicyclists regarding rules and responsibilities.	3. Identify and/or implement 4 to 5 corrective projects at identified top 10 high incident locations over a 10-year period.
• Expand community involvement with federal and state programs and education initiatives such as Safe Routes to School.	4. Conduct 1 to 2 Road Safety Audits at identified high crash locations every 2 years.
• Seek to improve user awareness along all transportation networks through better identification, pavement markings and signage with an emphasis on bicycle and pedestrian routes.	5. Increase the number of communities involved in the Safe Routes to School program.

Goal 1 – Improve and Maintain Safety and Security (cont.)	
Objectives	**Performance Measures**
• Seek to expand the number and use of variable message signs along major roads such as Route 2 and I-190 to inform drivers of potential unsafe conditions and important alerts.	6. Maintain involvement with the Central MA Regional Homeland Security Council and evacuation planning efforts.
• Promote projects that address key identified emergency and evacuation routes in order to maintain effectiveness.	7. Maintain the average number of preventable fixed route crashes under 2+ per month and demand responsive crashes under 5+ per month.

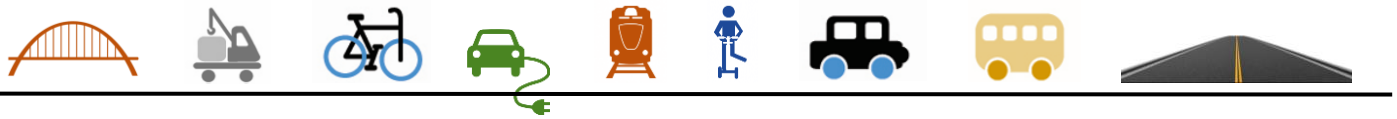
Goal 2 – Reduce Congestion and Improve Mobility	
Objectives	**Performance Measures**
• Monitor locations and promote projects that address congested roadways within the region.	1. Conduct Travel Time data collection along 3 to 5 major roadways throughout region on an annual basis.
• Support programs that quickly and efficiently address bridge deficiencies across all modes with an emphasis on freight and rail locations.	2. Identify 1 bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures.
• Encourage communities to address local mobility issues in order to promote mode shift options in congested areas.	3. Increase the number of Complete Street certified communities within the region. Seek to have a majority of communities formally certified within 10 years.
• Seek to increase travel options within the region through the promotion of trails, Complete Streets, transit, land use and their interactions.	

Goal 3 – Promote and Seek Equitable Transportation for All	
Objectives	**Performance Measures**
• Seek to increase access to transit options through improved dissemination of available service information.	1. Increase formal membership and public outreach within Montachusett Joint Transportation Committee (MJTC) of Title VI and Environmental Justice groups.
• Improve outreach and partnerships between RTA's and social service agencies, schools, health centers, neighborhood organizations, etc.	2. Conduct benefits/burdens review of federal aid projects identified through the TIP process on an annual basis.
• Seek to expand and increase transit service operations to improve job access and commercial services for all users.	3. Continue to work with the Montachusett Regional Transit Authority (MART) to expand outreach to and usage by Title VI and Environmental Justice communities through promotions and training methods on how to utilize the system.
• Promote the development of improvements and options across all modes for areas that serve Title VI and Environmental Justice populations.	
• Monitor fee options in order to maintain equitability for all users.	
• Actively seek and identify organizations and agencies of Title VI and Environmental Justice populations and conduct direct outreach to encourage involvement and participation in the planning process.	

Goal 4 – Improve System Preservation and Maintenance of All Modes	
Objectives	**Performance Measures**
• Seek to encourage and prioritize preservation projects within communities in order to maintain a state of good repair for all modes.	1. Continue pavement management data collection and analysis efforts on an annual basis through a rotating 3-year schedule of federal aid eligible roadways.

Goal 4 – Improve System Preservation and Maintenance of All Modes (cont.)	
Objectives	**Performance Measures**
• Continue to monitor, and revise as needed, the Transportation Evaluation Criteria (TEC) to encourage those projects that help to maintain a state of good repair.	2. Increase the percentage of categorized "Good" to "Excellent" federal aid eligible roadway miles within the region over a 10-year period.
• Continue the promotion and prioritization of bridge projects throughout the region.	3. Decrease the number of identified "Structurally Deficient" bridges within the Region.
• Encourage communities to maintain and monitor trials that provide transportation options throughout the year.	4. Review and revise the Transportation Evaluation Criteria (TEC) every 2 to 5 years to maintain a viable prioritization process.
• Seek to encourage additional funds for maintenance as well as the development of a potential federal/state funded preservation program.	5. Maintain the number of road service calls due to mechanical failures on the fixed route and demand responsive systems under 10 per month.
• Encourage and support continued operation, maintenance, state of good repair and expansion of the transit system.	6. Maintain a percentage of operated scheduled trips per month at 90% or better.
• Encourage communities with viable preservation projects to seek funding and implementation through and in collaboration with the Transportation Improvement Program (TIP) process.	7. Achieve an average on time ranking on the fixed route system of 95% by 2040.
• Encourage state and local officials to evaluate the benefits of a joint procurement process for equipment, materials and services to help reduce costs.	

Goal 5 – Improve Economic Vitality and Freight Movement	
Objectives	**Performance Measures**
• Seek to promote economic advantages of the regional trail network and recreational destinations.	1. Revise, update and distribute a Regional Trail map, in coordination with the Montachusett Regional Trail Coalition (MRTC), by 2020.
• Seek to establish and prioritize major trail connections throughout the region.	2. Review and analyze 1 to 2 freight corridors through development of a Unified Planning Work Program (UPWP) task every 5 years.
• Seek to promote and expand commuter transit and rail options beyond the urban centers.	
• Prioritize and improve railroad and other restricted bridges in order to enhance freight mobility.	
• Seek to improve freight and general vehicle access and connection to Route 2 throughout the region.	

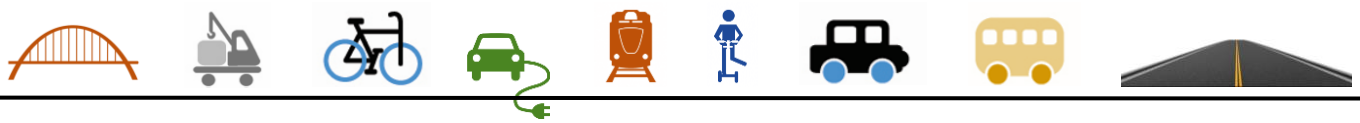


Goal 6 – Improve Transportation Options and Promote Heathy Modes	
Objectives	**Performance Measures**
• Seek to expand travel options and modes across the region through improved connections and services.	1. Increase the number of bicycle facilities, ex. Bicycle racks and lockers and on-board bus racks, at transit centers within 12 years.
• Promote additional bicycle facilities for transit centers and vehicles.	2. Conduct 3 to 4 walk audits over a 12-year period in interested communities.
• Promote an improved local review process that addresses issues related to Complete Streets, trail development, sidewalk implementation and mobility improvement as well as mode shift options within their community.	3. Establish a top 5 list of prioritized trail connections, within and across communities, in 4 years with updates every 4 years.

Goal 6 – Improve Transportation Options and Promote Heathy Modes (cont.)	
Objectives	**Performance Measures**
• Seek to increase and encourage a shift from single occupant vehicles to transit, bicycle and pedestrian modes through improved transit, van/car pool and trail options. • Improve infrastructure, i.e. sidewalks, benches, shelters, shared lanes, etc., along competing modes to encourage increased usage.	

Goal 7 – Reduce Green House Gas and Promote Environmental Practices and Sustainability	
Objectives	**Performance Measures**
• Seek to reduce Greenhouse Gas emissions through support and implementation of Congestion Mitigation Air Quality (CMAQ) and Transportation Alternative Program (TAP) projects as well as state mode shift goals.	1. Increase percentage of alternative fuel vehicles within the overall transit fleet by 2020.
• Prioritize vehicle replacement in the transit fleet with applicable and cost-effective alternative fuel vehicles.	2. Program and implement 100% of Congestion Mitigation Air Quality (CMAQ) projects within the regional Transportation Improvement Program (TIP).
• Encourage communities to promote and support Green Streets through Low Impact (LID) and Transit Oriented (TOD) Development projects as well as stormwater drainage improvement.	
• Encourage and promote transit options to new residential and smart growth developments.	
• Encourage and support the use of alternative fuel vehicles by the public with infrastructure support services and by transit systems through vehicle replacement programs.	

As previously stated, these performance measures are to be utilized on a regional level to assist in monitoring RTP goals. They are not intended to replace any state performance measure adopted by the MPO.



In the four years since the development of the 2016 RTP, MRPC has monitored progress of toward meeting these PM. Many of the measures are expected to be monitored over a period of 10 years or more, however, they are still being monitored to determine if they are on track. The following is a Performance Measure "Dashboard" which summarizes the progress of the PM in the Montachusett region.

Performance Measure Dashboard

Goal	Performance Measure	Time Period	Status	Action Needed	Action Year	Notes
Improve and Maintain Safety and Security	*Reduce the Regional EPDO and percentage of fatal and injury crashes among vehicles, bicycles and pedestrians by 10% over a 10 year period.	10 Years	Benchmark set, monitoring ongoing	Monitor/ Report	2025	Pending further analysis
	*Reduce the fatality rate by 10% and the serious injury rate by 10% from current levels in 10 years.	10 Years	Benchmark set, monitoring ongoing	Monitor/ Report	2025	Pending further analysis
	*Identify and/or implement 4 to 5 corrective projects at identified top 10 high incident locations over a 10 year period.	10 Years	Benchmark set, monitoring ongoing	Identification/ Implementation	2025	Pending further analysis
	*Conduct 1 to 2 Road Safety Audits at identified high crash locations every 2 years.	2 Years	Achieved	Road Safety Audits	Ongoing	4 road safety audits completed in 2 years
	*Increase the number of communities involved in the Safe Routes to School program.	General	Benchmark set, monitoring ongoing	Report of number of communities involved	Ongoing	Increased from 14 out of 22 (63%) communities in 2016 to 16 (73%) communities in 2019
	*Maintain involvement with the Central MA Regional Homeland Security Council and evacuation planning efforts.	General	Achieved	Participation	Ongoing	Evacuation route mapping project completed in 2016.
	*Maintain the average number of preventable fixed route crashes under 2+ per month and demand responsive crashes under 5+ per month.	General	Monitoring ongoing, achieved	Meet benchmarks	Ongoing	Only missed goal in 1 month out of 12.
Reduce Congestion and Improve Mobility	*Conduct Travel Time data collection along 3 to 5 major roadways throughout region on an annual basis.	Annual	Amended to as needed basis	Travel Time Data	Yearly	Previously utilized TravTime software is now obsolete. Monitoring now occurs on project need basis using multiple platforms.
	*Identify 1 bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures.	Every 2 Years	Achieved	Bottleneck Study	2017, 2019	Merriam Ave/South St. cooridor study completed in 2018, Main St. cooridor of Ayer planned for 2020
	*Increase the number of Complete Street certified communities within the region. Seek to have a majority of communities formally certified within 10 years.	10 Years	Achieved	Monitor/ Report	2025	Increased from 9 of 22 (41%) communities in 2015 to 17 of 22 (77%) communities in 2019
Promote and Seek Equitable Transportation for All	*Increase formal membership and public outreach within Montachusett Joint Transportation Committee (MJTC) of Title VI and Environmental Justice groups.	General	Ongoing effort, achieved	Outreach	Ongoing	Increased membership
	*Conduct benefits/burdens review of federal aid projects identified through the TIP process on an annual basis.	Annual	Achieved	Conduct Review	Annually	Completed an equity analysis in every TIP and UPWP since 2016
	*Continue to work with the Montachusett Regional Transit Authority (MART) to expand outreach to and usage by Title VI and Environmental Justice communities through promotions and training methods on how to utilize the system.	General	Ongoing effort, achieved	Outreach	Ongoing	MART has created a series of videos on how to use MART's fixed route buses in English and Spanish
Improve System Preservation and Maintenance of All Modes	*Continue pavement management data collection and analysis efforts on an annual basis through a rotating 3 year schedule of federal aid eligible roadways.	General	On-track	Data Collection/ Analysis	Ongoing	Amended to four year basis to coincide with MassDOT collection program and development of the RTP.
	*Increase the percentage of categorized "Good" to "Excellent" federal aid eligible roadway miles within the region over a 10 year period.	10 Years	Benchmark set, monitoring ongoing	Monitor/ Report	2025	In danger of not achieving 10 year measure.
	*Decrease the number of identified "Structurally Deficient" bridges within the Region.	General	Monitoring ongoing, achieved	Monitor/ Report	Ongoing	Has been achieved in most recent years, in danger of not being achieved in future years.
	*Review and revise the Transportation Evaluation Criteria (TEC) every 2 to 5 years to maintain a viable prioritization process.	2 - 5 Years	Achieved	Review/ Revise	Before 2020	Most recently achieved in 2018
	*Maintain the number of road service calls due to mechanical failures on the fixed route and demand responsive systems under 10 per month.	General	Monitoring monthly	Monitor/ Report	Ongoing	Fell above in 4 out of 12 months. Bus fleet older.
	*Maintain a percentage of operated scheduled trips per month at 90% or better.	General	Monitoring ongoing, achieved	Monitor/ Report	Ongoing	
	*Achieve an average on time ranking on the fixed route system of 95% by 2040.	General	Monitoring ongoing, achieved	Monitor/ Report	Ongoing	
Improve Economic Vitality and Freight Movement	*Revise, update and distribute a Regional Trail map, in coordination with the Montachusett Regional Trail Coalition (MRTC), by 2020.	2020	Achieved	Update Maps	Before 2020	Updated regional guide & individual community maps (2018)
	*Review and analyze 1 to 2 freight corridors through development of a Unified Planning Work Program (UPWP) task every 5 years.	Every 5 Years	Ongoing	Review/ Analysis	Before 2020	Future UPWP projects planned
Improve Transportation Options and Promote Heathy Modes	*Increase the number of bicycle facilities, ex. Bicycle racks and lockers and on board bus racks, at transit centers within 12 years.	Within 12 Years	On-track	Review	Before 2027	Expanding # of vehicles with racks in FFY20
	*Conduct 3 to 4 walk audits over a 12 year period in interested communities.	Within 12 Years	On track	Outreach, organize, conduct walk audits	Before 2027	Conducted one walk audit in Lunenburg (2019)
	*Establish a top 5 list of prioritized trail connections, within and across communities, in 4 years with updates every 4 years.	Every 4 Years	On track	Prioritization	2019	MRPC has been working closely with the Montachusett Regional Trails Coalition on this list. It continues to be updated yearly.
Reduce Green House Gas and Promote Environmental Practices and Sustainability	*Increase percentage of alternative fuel vehicles within the overall transit fleet by 2020.	2020	Feasibility study on electric vehicles needs to take place first	Review	2020	This will not be achieved until later years Pending further analysis
	*Program and implement 100% of Congestion Mitigation Air Quality (CMAQ) projects within the regional Transportation Improvement Program (TIP).	General	No longer relavent/ change in allocation requirements has occurred	Implementation	Ongoing	CMAQ no longer is dispersed as targets, although CMAQ is still actively assigned to projects in the region.

Statewide and Regional Transportation Performance Management

FHWA defines Transportation Performance Management as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. In short, Transportation Performance Management:

- Is systematically applied, a regular ongoing process
- Provides key information to help decision makers allowing them to understand the consequences of investment decisions across transportation assets or modes
- Improving communications between decision makers, stakeholders and the traveling public.
- Ensuring targets and measures are developed in cooperative partnerships and based on data and objective information

Effective on April 14, 2016 FHWA established a final rule on the first of its Performance Measures, Safety Measures (PM 1). Targets related to PM 1 were then set by MassDOT and adopted by the Montachusett MPO for CY 2019 on February 20, 2019. Subsequently, FHWA established two additional performance measures that state Departments of Transportation and MPOs needed to adopt and track. The National Highway System Bridge and Pavement Condition Performance Measure (PM 2) and the Systems Performance Measures, Congestion, Reliability and Emissions (PM 3) were required to be established by the end of 2018. MassDOT then provided statewide target information for PM 2 and PM 3 to the Montachusett MPO for their review and either their adoption by the MPO or the establishment of their own regional PM 2 and PM 3. After review and discussion, the Montachusett formally adopted the statewide PM 2 targets on October 17, 2018 and PM 3 targets on September 19, 2018.

Safety Performance Measures (PM1)

Montachusett MPO has chosen to adopt the statewide safety performance measure targets set by MassDOT for Calendar Year (CY) 2019. In setting these targets, MassDOT has followed FHWA guidelines by using statewide crash data and Highway Performance Monitoring System (HPMS)

data for vehicle miles traveled (VMT) in order to calculate 5 year, rolling average trend lines for all FHWA-defined safety measures. For CY 2019 targets, four of the five safety measures—total number of fatalities, rate of fatalities per 100 million vehicle miles traveled, total number of incapacitating injuries, and rate of incapacitating injuries per 100 million VMT—were established by extending their trend lines into the 2015-2019 period. All four of these measures reflect a modest decrease in statewide trends. The fifth safety measure, the total number of combined incapacitating injuries and fatalities for non-motorized modes, is the only safety measure for which the statewide trend line depicts an increase. MassDOT's effort to increase non-motorized mode share throughout the Commonwealth has posed a challenge to simultaneously reducing non-motorized injuries and fatalities. Rather than adopt a target that depicts an increase in the trend line, MassDOT has elected to establish a target of non-motorized fatalities and injuries and for CY 2019 that remains constant from the rolling average for 2012–2016. In recent years, MassDOT and the Montachusett MPO have invested in "complete streets," bicycle and pedestrian infrastructure, intersection and safety improvements in both the Capital Investment Plan (CIP) and Statewide Transportation Improvement Program (STIP) to address increasing mode share and to incorporate safety mitigation elements into projects. Moving forward, Montachusett MPO, alongside MassDOT, is actively seeking to improve data collection and methodology for bicycle and pedestrian VMT counts and to continue analyzing crash clusters and crash counts that include both motorized and non-motorized modes in order to address safety issues at these locations.

In all safety categories, MassDOT has established a long-term target of "Toward Zero Deaths" through MassDOT's Performance Measures Tracker[1] and will be establishing safety targets for the MPO to consider for adoption each calendar year. While the MPO is not required by FHWA to report on annual safety performance targets, FHWA guidelines require MPOs to adopt MassDOT's annual targets or to establish their own each year.

[1] https://www.mass.gov/lists/tracker-annual-performance-management-reports

The safety measures MassDOT has established for CY 2019, and that Montachusett MPO has adopted, are as follows:

1) Fatalities: The target number of fatalities for years CY 2019 is 353, down from an average of 364 fatalities for the years 2012–2016. [See Figure 3-1 for Montachusett MPO vs. statewide comparison of the trend for this performance measure]

2) Rate of Fatalities per 100 million VMT: The target fatality rate for years CY 2019 is 0.58, down from a 0.61 average for years 2012–2016. [See Figure 3-1 for Montachusett MPO vs. statewide comparison of the trend for this performance measure]

3) Serious Injuries: The target number of incapacitating injuries for CY2019 is 2801, down from the average of 3146 for years 2012–2016. [See Figure 3-2 for Montachusett MPO vs. statewide comparison of the trend for this performance measure]

4) Rate of Incapacitating Injuries per 100 million VMT: The incapacitating injury rate target for CY2019 is 4.37 per year, down from the 5.24 average rate for years 2012–2016. [See Figure 3-2 for Montachusett MPO vs. statewide comparison of the trend for this performance measure]

5) Total Number of Combined Incapacitating Injuries and Fatalities for Non-Motorized Modes: The CY2019 target number of fatalities and incapacitating injuries for non-motorists is 541 per year, the same as the average for years 2012–2016. [See Figure 3-3 for Montachusett MPO vs. statewide comparison of the trend for this performance measure]

Figure 3 - 1. Total Fatalities Per Year Montachusett vs. Statewide

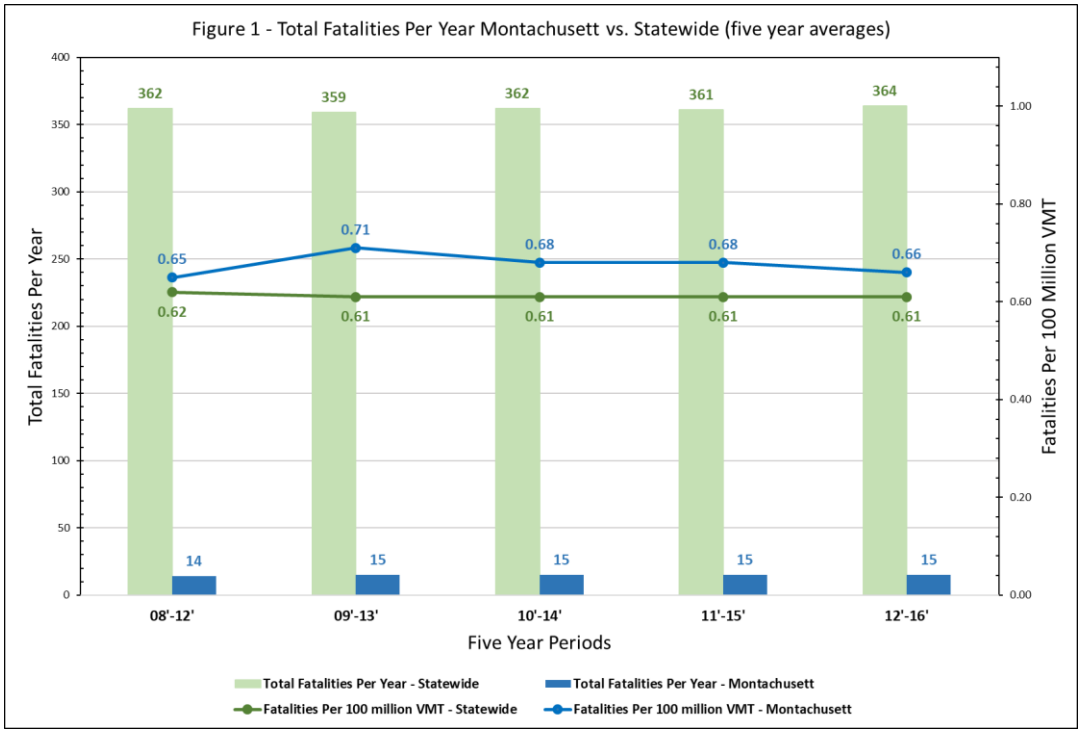


Figure 3 - 2. Total Serious Injuries Per Year Montachusett MPO vs. Statewide

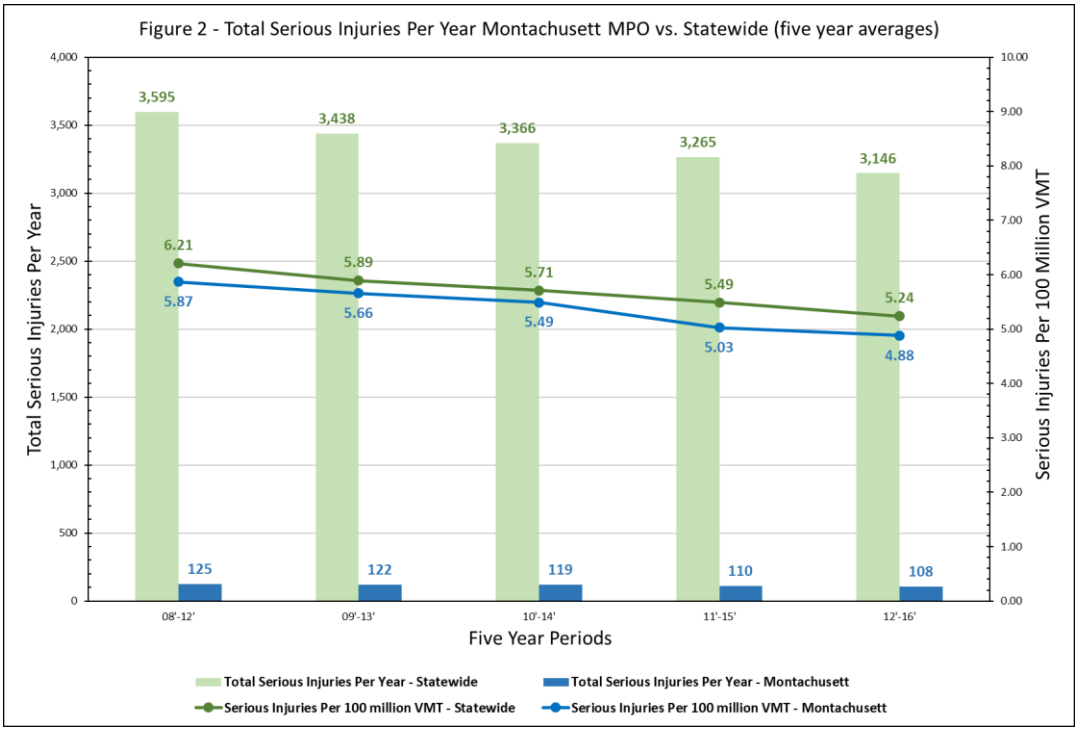
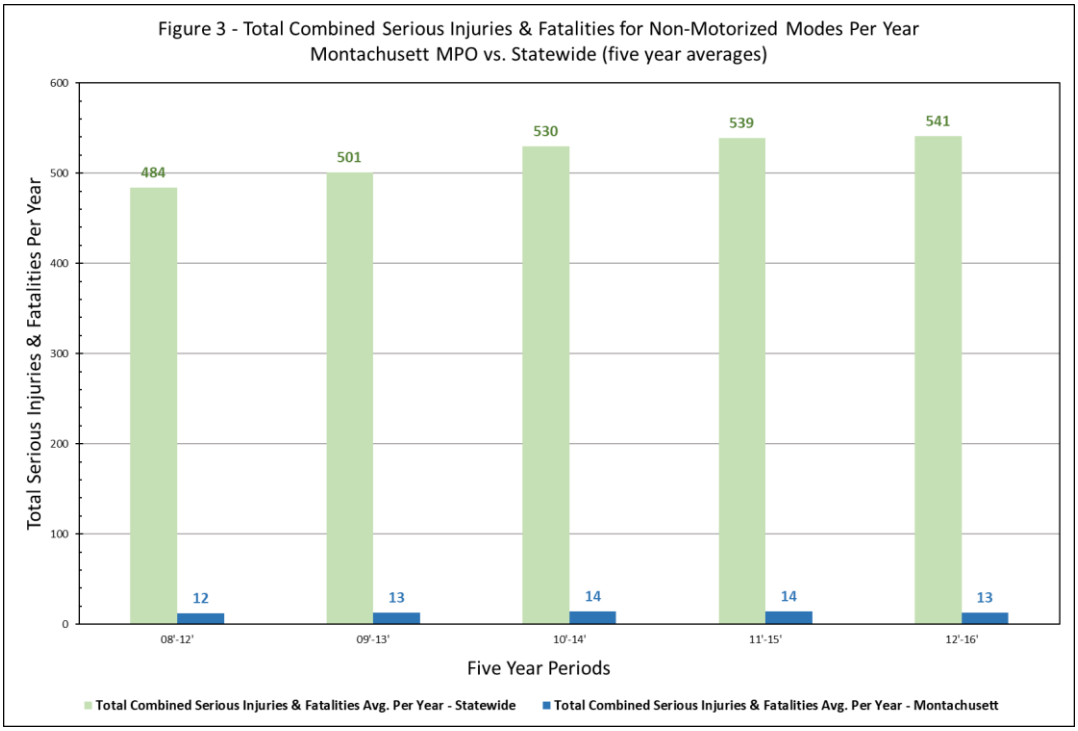


Figure 3 - 3. Total Combined Serious Injuries & Fatalities for Non-Motorized Modes



Source of Data: MassDOT, Office of Transportation Planning

Bridge & Pavement Performance Measures (PM2)

Montachusett MPO has chosen to adopt the 2-year (2020) and 4-year (2022) statewide bridge and pavement performance measure targets set by MassDOT. MassDOT was required to adopt a statewide target by May 20th, 2018, with MPOs either adopting the statewide target or establishing their own by November 2018. In setting these targets, MassDOT has followed FHWA guidelines by measuring bridges and pavement condition using the 9-point National Bridge Inventory Standards (NBIS); the International Roughness Index (IRI); the presence of pavement rutting; and the presence of pavement cracking. 2-year and 4-year targets were set for six individual performance measures: percent of bridges in good condition; percent of bridges in poor condition; percent of Interstate pavement in good condition; percent of Interstate pavement in poor condition; percent of non-Interstate pavement in good condition; and percent of non-Interstate pavement in poor condition. All of the above performance measures are tracked in greater detail in MassDOT's Transportation Asset Management Plan (TAMP), which is due to be finalized in July 2019.

Targets for bridge-related performance measures were determined by identifying which bridge projects are programmed and projecting at what rate bridge conditions deteriorate. The bridge-related performance measures measure the percentage of deck area, rather than the total number of bridges.

Performance targets for pavement-related performance measures were based on a single year of data collection, and thus were set to remain steady under the guidance of FHWA. These measures are to be revisited at the 2-year mark (2020), once three years of data are available, for more informed target setting.

MassDOT continues to measure pavement quality and to set statewide short-term and long-term targets in the MassDOT Performance Management Tracker using the Pavement Serviceability Index (PSI), which differs from IRI. These measures and targets are used in conjunction with federal measures to inform program sizing and project selection.

Table 3 - 1. Statewide Performance Measures (PM 2)

Performance Measure	Current (2017)	2-year target (2020)	4-year target (2022)
Bridges in good condition	15.22%	15%	16%
Bridges in poor condition	12.37%	13%	12%
Interstate Pavement in good condition	74.2%	70%	70%
Interstate Pavement in poor condition	0.1%	4%	4%
Non-Interstate Pavement in good condition	32.9%	30%	30%
Non-Interstate Pavement in poor condition	31.4%	30%	30%

Reliability, Congestion, & Emissions Performance Measures (PM3)

Montachusett MPO has chosen to adopt the 2-year (2020) and 4-year (2022) statewide reliability, congestion, and emissions performance measure targets set by MassDOT. MassDOT was

required to adopt a statewide target by May 20th, 2018, with MPOs either adopting the statewide target or establishing their own by November 2018.

MassDOT followed FHWA regulation in measuring Level of Travel Time Reliability (LOTTR) on both the Interstate and non-Interstate NHS as well as Truck Travel Time Reliability (TTTR) on the Interstate system using the National Performance Management Research Dataset (NPMRDS) provided by FHWA. These performance measures aim to identify the predictability of travel times on the roadway network by comparing the average travel time along a given segment against longer travel times. For LOTTR, the performance of all segments of the Interstate and of the non-Interstate NHS are defined as either reliable or unreliable based on a comparison between the 50th percentile travel time and the 80th percentile travel time, and the proportion of reliable segments is reported. For TTTR, the ratio between the 50th percentile travel time and the 90th percentile travel time for trucks only along the Interstate system is reported as a statewide measure. As this data set has but one year of consistent data, FHWA guidance has been to set conservative targets and to adjust future targets once more data becomes available. To that end, MassDOT's reliability performance targets are set to remain the same.

Montachusett MPO — an agency whose planning area includes communities in the Boston Urbanized Area (UZA), and as a signatory to the 2018 Boston UZA Memorandum of Understanding (Boston UZA MOU)—has also adopted 2-year (2020) and 4-year (2022) Boston UZA-wide congestion performance measure targets. These performance measures are the percentage of non-single occupancy vehicle (SOV) travel and the Peak Hour Excessive Delay (PHED). Targets were developed in coordination with state Departments of Transportation and neighboring MPOs with planning responsibility for portions of the Boston UZA.

The percentage of non-SOV travel is approximated using the U.S. Census Bureau's American Community Survey (ACS) Journey-to-Work data. In the Boston UZA, the proportion of non-SOV travel has been steadily increasing and is projected to continue increasing at a rate of 0.32% annually.

PHED is measured by totaling the number of hours spent in excessive delay (defined as travel time at 20 miles per hour or at 60% of the posted speed limit, whichever is greater) in peak hours (between 6:00am and 10:00, and between 3:00pm and 7:00pm) divided by the total UZA population. As of target-setting, there was only one year of data available. As such, the performance targets have been set flat until further data is available.

Emissions reduction targets are measured as the sum total of all emissions reductions anticipated through CMAQ-funded projects in non-attainment or air quality maintenance areas (currently the cities of Lowell, Springfield, Waltham, and Worcester, and the town of Oak Bluffs) identified in the Statewide Transportation Improvement Program (STIP). This anticipated emissions reduction is calculated using the existing CMAQ processes.

Table 3 - 2. Statewide Performance Measures (PM 3)

Measure	Current (2017)	2-year (2020)	4-year (2022)
Non-Interstate LOTTR	80%	80%	80%
Interstate LOTTR	68%	68%	68%
TTTR	1.85	1.85	1.85
PHED (Boston UZA)	18.31	18.31	18.31
% non-SOV (Boston UZA)	33.6% (2016)	34.82%	35.46%
Emissions Reductions	Baseline (FFY 14–17)	1,622 CO 497.9 Ozone	TBD CO (Springfield) 1.1 Ozone

Transit Asset Management

In 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) mandated, and in 2015 the Fixing America's Surface Transportation Act (FAST) reauthorized, FTA to develop a rule to establish a strategic and systematic process of operating, maintaining and improving public transportation capital assets effectively through their entire life cycle. FTA's national Transit Asset Management System Rule:

- Defines "state of good repair"
- Requires grantees to develop a TAM plan
- Establishes performance measures

- Establishes annual reporting requirements to the National Transit Database
- Requires FTA to provide technical assistance

In July 2016, FTA published a Final Rule for Transit Asset Management. The rule requires FTA grantees to develop asset management plans for their public transportation assets, including vehicles, facilities, equipment, and other infrastructure.

TAM requirements in this final rule are part of a larger performance management context. MAP-21 created a performance-based and multimodal program to strengthen the U.S. transportation system, which is comprised of a series of nine rules overseen by FTA and the Federal Highway Administration (FHWA). FTA is tasked with developing other rules, including the National Public Transit Safety Plan and the Public Transportation Agency Safety Plan, and has worked jointly with FHWA on a rule to manage Statewide and Metropolitan Planning.

The Montachusett Regional Transit Authority (MART) completed a TAM plan in September of 2018 and presented it to the Montachusett MPO. The Montachusett MPO has adopted targets in the following categories in the spring of 2019

- Rolling Stock
- Equipment
- Facilities

As dictated by the Final Rule, a Tier I TAM Plan must include the following nine elements:

1) Inventory of Capital Assets – An inventory of the number and type of capital assets. The inventory must include all capital assets that a provider owns, except equipment with an acquisition value under $50,000 that is not a service vehicle.

2) Condition Assessment – A condition assessment of those inventoried assets for which a provider owns or has direct capital responsibility.

3) Identification of Decision Support Tool or Processes – A description of analytical processes or

decision-support tools that a provider uses to estimate capital investment needs over time and develop its investment prioritization.

4) Investment Prioritization – A project-based prioritization of investments.

5) TAM and SGR policy – A TAM policy is the executive-level direction regarding expectations for transit asset management; a TAM strategy consists of the actions that support the implementation of the TAM policy.

6) Implementation strategy – The operational actions that a transit provider decides to conduct, in order to achieve its TAM goals and policies.

7) List of key annual activities – The actions needed to implement a TAM plan for each year of the plan's horizon.

8) Identification of resources – A summary or list of the resources, including personnel, that a provider needs to develop and carry out the TAM plan.

9) Evaluation plan – An outline of how a provider will monitor, update, and evaluate, as needed, its TAM plan and related business practices to ensure the continuous improvement.

Included in the table below are MART's determined performance targets for its assets by category and FTA defined performance measures.

Asset Category - Performance Measure	Asset Class	2019 Target	2020 Target	2021 Target	2022 Target	2023 Target
REVENUE VEHICLES						
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark	*BU - Bus*	5%	5%	5%	2%	2%
	CU - Cutaway Bus	20%	20%	15%	15%	10%
	VN - Van	30%	30%	20%	10%	5%
EQUIPMENT						
Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	*Non-Revenue/Service Automobile*	65%	60%	60%	50%	50%
	Trucks and other Rubber Tire Vehicles	0%	0%	0%	0%	0%
	Staff/Inspector SUVs	25%	25%	20%	20%	15%
FACILITIES						
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	*Administration*	0%	0%	0%	0%	0%
	Maintenance	0%	0%	0%	0%	0%
	Parking Structures	0%	0%	0%	0%	0%
	Passenger Facilities	0%	0%	0%	0%	0%
	Operations/Vehicle Storage	0%	0%	0%	0%	0%

4 Regional Profile

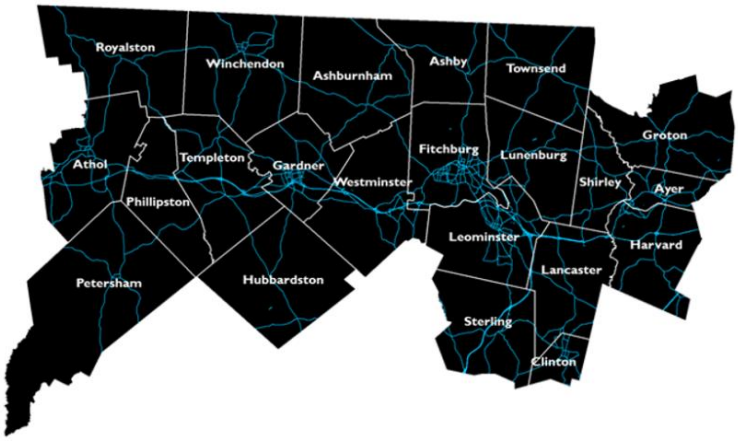
DEMOGRAPHICS IN THE MONTACHUSETT REGION

This following provides a profile of the Montachusett region through various sets of data, i.e. the U.S. Census and the American Community Surveys (ACS), as well as various MRPC reports developed in accordance with local studies and contracts.

Through the tables, charts and analyses presented, an understanding of the population that comprises the Montachusett region and its unique features and characteristics will be gained. The various data sets presented highlight the continued changing face of the region and help provide some background to the relationship that exists between the communities and their needs.

Background & History

The Region was settled as early as the 17th Century and began as small settlements that evolved from an era of agrarianism into the age of industrialization and now into the era of information and communications. The physical landscape is a mixture of compact urban centers and small rural communities containing "town commons". Comprised of 22 communities located in north central Massachusetts, the region measures approximately 685 square miles in size. Of this area, approximately 654 square miles (or approximately 95%) is land.



The Montachusett Region's earliest settlements were founded as trading outposts for the Massachusetts Bay Colony. Lancaster and Groton were settled in the mid-1600's to ensure the flow of animal pelts from the interior to Boston. By the second half of the eighteenth century, most communities in the region were settled. Originally, local economies focused on agriculture but, since farming

provided a poor return, manufacturing quickly became the dominant economic force in the region.

Montachusett communities harnessed swift-flowing streams and rivers for water-powered manufacturing. The first mills were allied with agricultural production, but the nineteenth century saw the establishment of other industries, including paper, textile and woodworking industries. By the mid-nineteenth century, the production of lumber and wood products became the region's largest industry, and the City of Gardner was known internationally as a major center of chair manufacturing.

The growth of the region was accelerated by railroad connections enabling the easy transport of materials, goods and people. Communities with an industrial base prospered and expanded with the influx of migrants both foreign and US born. Smaller towns did not see widespread growth. However, their industrialized neighbors enjoyed a heyday during the end of the 19th Century.

The 20th Century saw a period of economic decline that was caused by the migration of industries to southern states and the Great Depression. The smaller industrialized communities suffered severely and recovered slowly. Today, the region's more urbanized communities are dominated by "mature" manufacturing industries, such as Gardner's surviving furniture mills and Leominster's surviving plastics companies. Other local economies, recognizing the instability of the region's industrial base, are undergoing a transition away from specialization in manufacturing industries. One foray into tourism has proven successful with the creation of Johnny Appleseed theme marketing and the Johnny Appleseed Trail Association, Inc. (JATA). The JATA offers a higher visibility to agritourism businesses in Phillipston and Leominster.

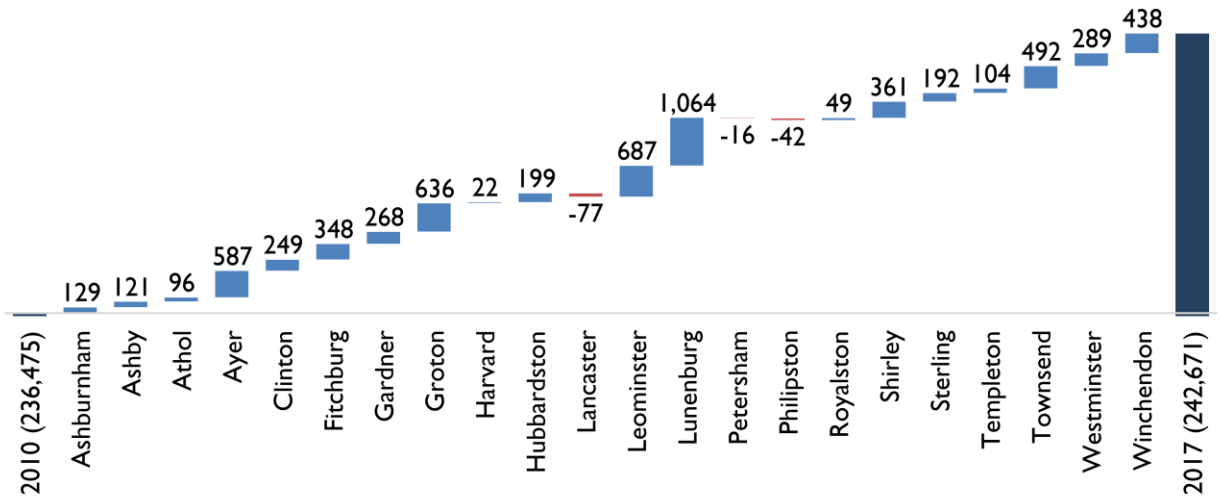
Regional Analysis

The following section identifies and highlights several key demographics that help to paint the picture that is the Montachusett Region. From a review of this information, a series of regional trends and developments are identified. These trends, combined with input from the general public and local officials, will help to establish the future growth of the Montachusett Region.

Population

The Montachusett Region witnessed a 2.6% increase in its population from 2010 to 2017, welcoming an estimated 6,196 new residents during this time (see Figure 4 -1). As of 2017, the Region boasts a population of 242,671 residents across its 22 communities.

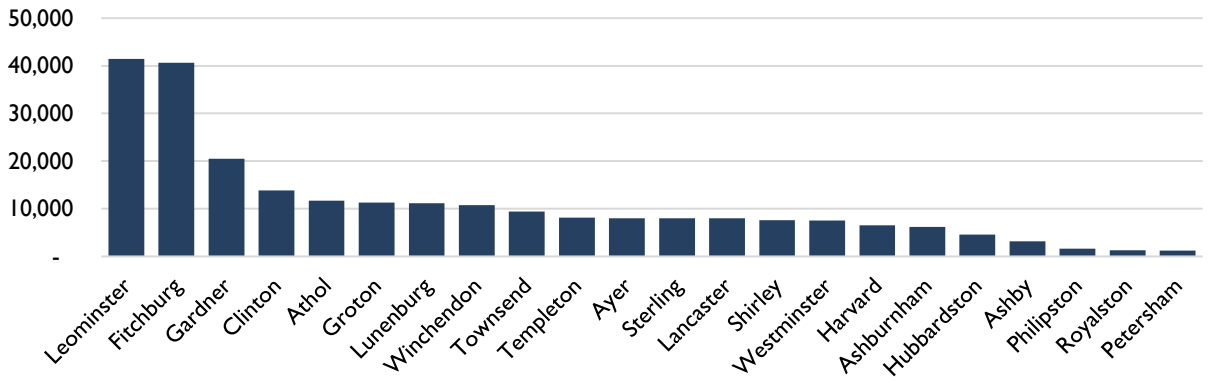
Figure 4 - 1. Population Change in the Montachusett Region (2010 to 2017)



Source: US Census, American Community Survey (2013-2017) 5-Year Estimates

Lunenburg saw the largest population increase in recent years with approximately 1,064 new residents (a 10.6% increase from 2010). The majority of communities saw more modest population increases, while three communities – Lancaster, Petersham, and Phillipston – experienced a slight decline in population (-1%, -1.3%, and -2.5% respectively).

Figure 4 - 2. Population by Community

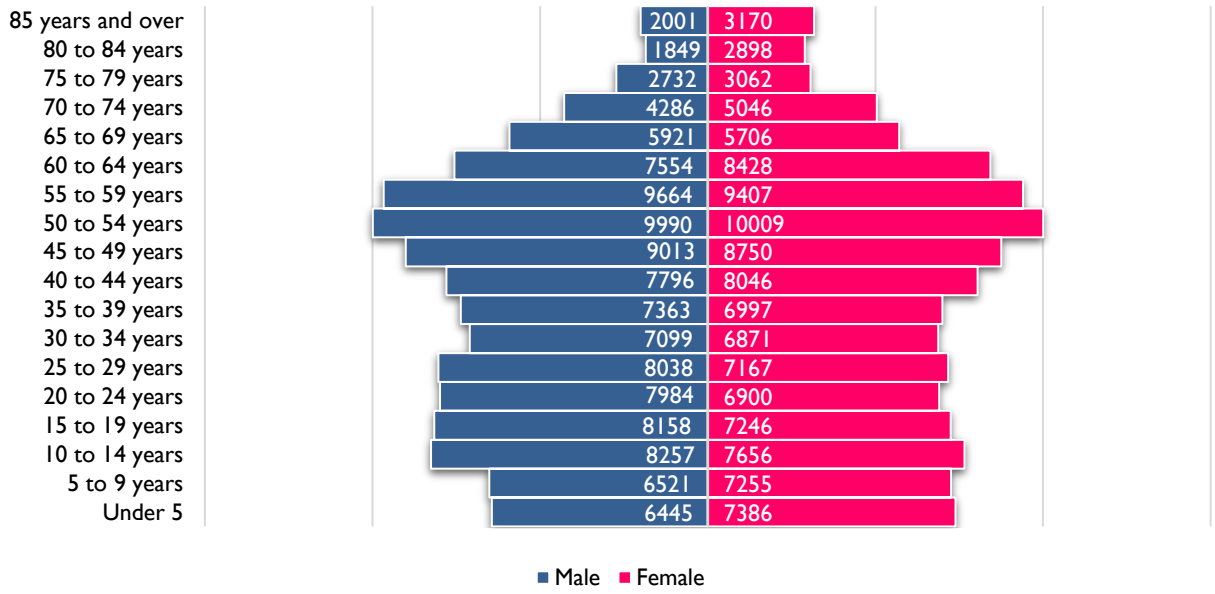


Source: American Community Survey (2013-2017) 5-Year Estimates

Age

The Montachusett Region is considerably older than the state or nation as a whole (see Figure 4 - 3), a trend that has been steadily rising in recent decades. In 2017, 19 of the Region's 22 communities had a higher median age than Massachusetts, up from just eight in 1990. According to the most recent data from the American Community Survey (ACS), nearly one-quarter (23.4%) of Montachusett residents are between the ages of 45 and 59 years old.

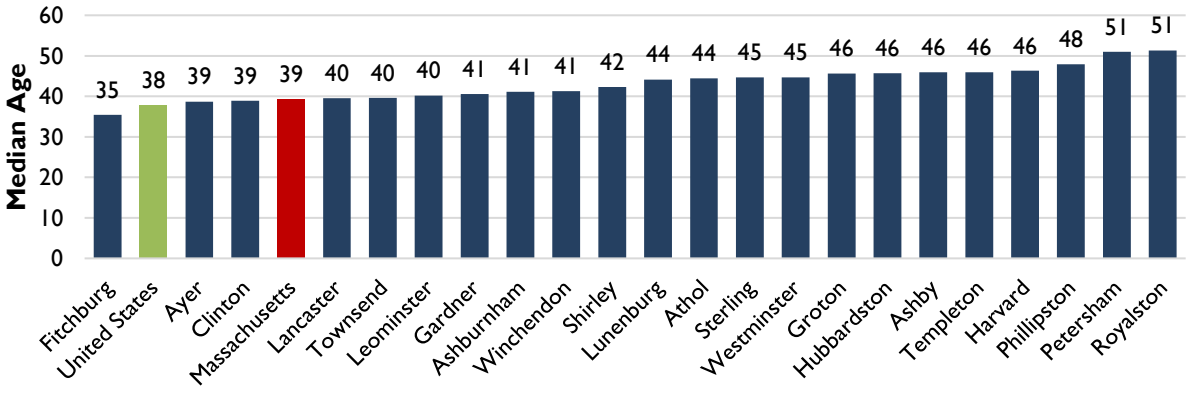
Figure 4 - 3. Age Distribution by Gender, Montachusett Region



Source: American Community Survey (2013-2017) 5-Year Estimates

The large proportion of residents nearing retirement age poses a number of planning challenges for the Region, including ensuring accessibility to health care services, public transportation, senior housing, as well as generational shifts in employment and succession in the workforce.

Figure 4 - 4. Median Age in Montachusett Communities Compared to Massachusetts and the US

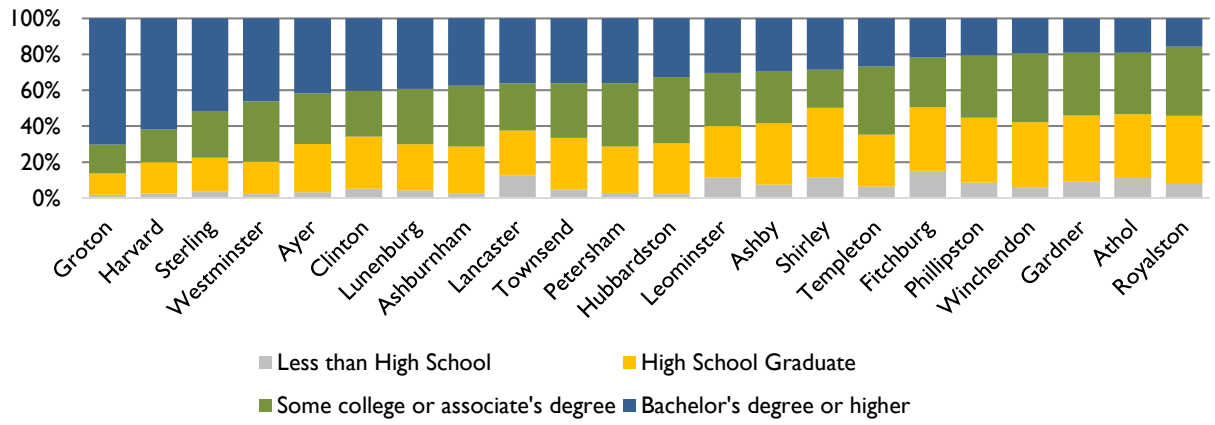


Source: American Community Survey (2013-2017) 5-Year Estimates

Educational Attainment

Montachusett communities range considerably in terms of highest level of educational attainment (see Figure 4 - 5).

Figure 4 - 5. Highest Level of Educational Attainment, Montachusett Region



Source: American Community Survey (2013-2017) 5-Year Estimates

Groton boasts the highest percentage of residents with a Bachelor's degree or higher with 70.3% of residents holding a Bachelor's or post-graduate degree (nearly 4.5 times that of Royalston).

In Table 4 - 1, we see increasing levels of educational attainment across the board for those aged 25 to 34 years old. Graduation rates between 2000 and 2017 grew for both males and females for both high school and bachelor's degrees and higher. Most significantly, we witnessed a 45% increase in the proportion of women aged 25 to 34 years old with a Bachelor's degree or higher.

Table 4 - 1. Highest Level of Educational Attainment (Aged 25 to 34 years)

Highest Level of Educational Attainment	Male		Female	
	2000	2017	2000	2017
High school degree or higher	85.3%	88.1%	90.7%	92.7%
Bachelor's degree or higher	21.2%	26.3%	27.3%	39.6%

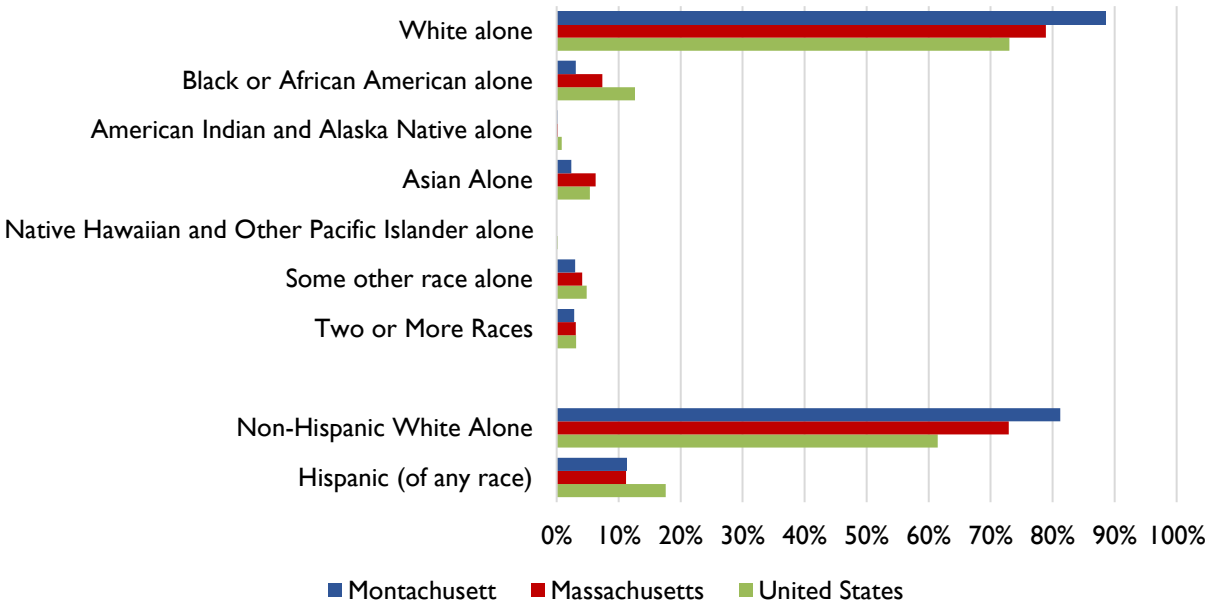
Source: US Census, American Community Survey (2013-2017) 5-Year Estimates

Still, educational attainment in the region remains lower than the state as a whole. In 2017, it was estimated than 92.1% of men and 94.4% of women aged 25 to 34 in Massachusetts received a high school degree or higher, while 46% and 55.8% received a bachelor's degree or higher. The trend toward having a more educated population is valuable as the economic sustainability of the region depends on ensuring a robust workforce that includes young professionals and careers to support their success.

Race

The Montachusett Region remains a predominantly white region but is trending toward increased diversity. The Region currently has a higher proportion of residents who identify as "white alone" when compared respectively to the state and nation as whole (see Figure 4 - 6).

Figure 4 - 6. Race in the Montachusett Region Compared to Massachusetts and the United States

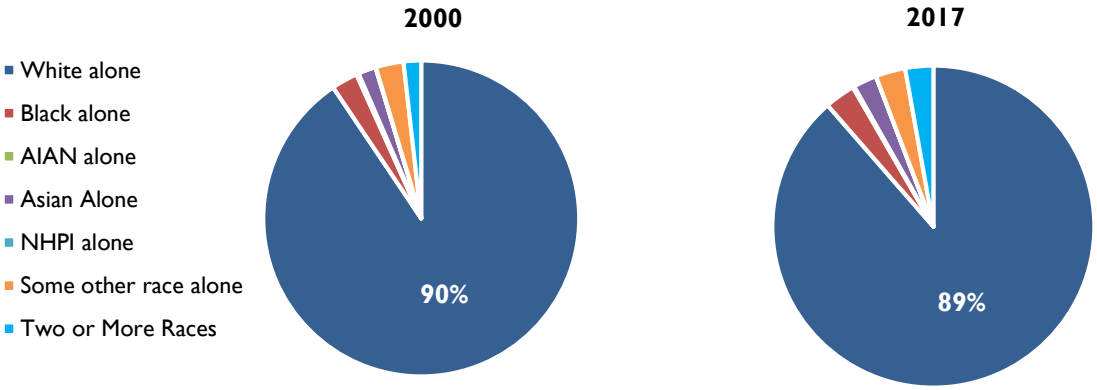


Source: American Community Survey (2013-2017) 5-Year Estimates

However, in the period between 2000 and 2017, we observed the following demographic changes as they pertain to race:

1. The number of Hispanic residents grew from 15,672 to 27,511 (+75.5%)
2. The number of residents who self-identified as Black or African American alone grew from 6,127 to 7,451 (+21.6%)
3. The number of Asian residents grew from 4,098 to 5,743 (+40.1%)
4. The number of residents who identified as two or more races increased from 4,127 to 6,828 (+65.4%)

Figure 4 - 7. Race in the Montachusett Region (2000 to 2017)

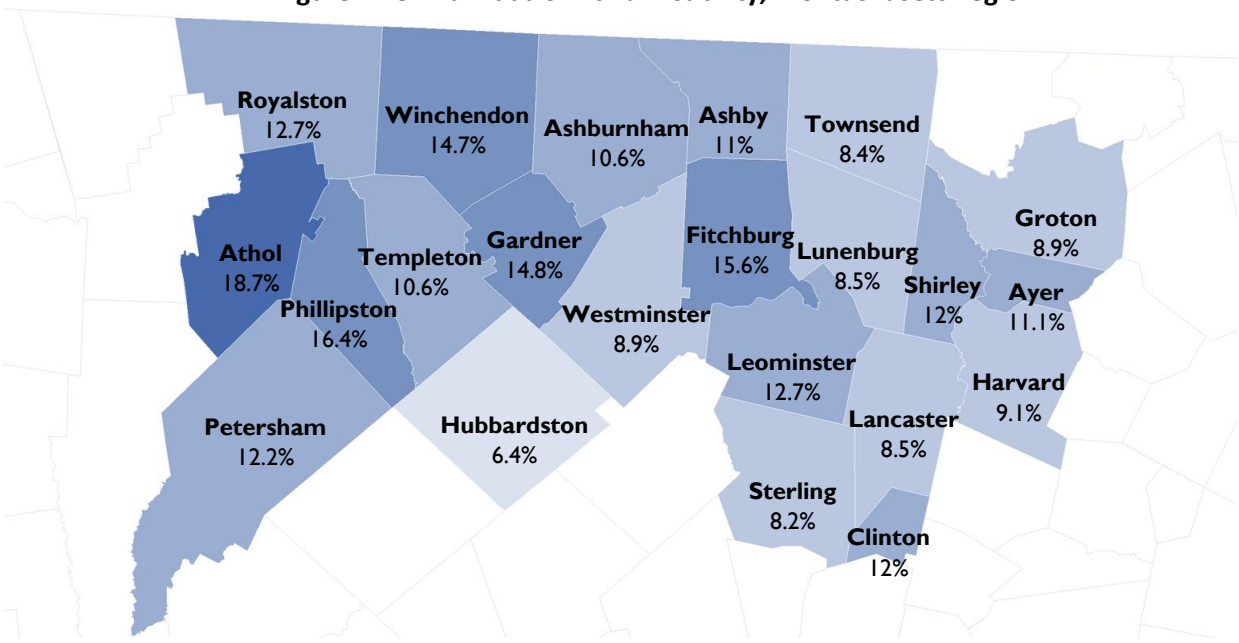


Source: US Census, American Community Survey (2013-2017) 5-Year Estimates

Disability

In Massachusetts, 11.6% of total individuals report having a disability (ACS 2017). A disability refers to difficulty hearing, vision, cognitive, ambulatory, self-care, and/or living independently. Ten Montachusett communities have a higher proportion of residents managing a disability than the state as a whole (Figure 4 - 8), with Athol, Phillipston, and Fitchburg topping the list. Among other important planning considerations, the comparatively high percentages of residents with disabilities, and a steadily aging population, emphasizes the importance of multimodal transportation access. Access to transportation services through the Montachusett Regional Transit Authority (MART) offers a vital lifeline for many to ensure equitable access to employment, education, as well as social and healthcare services.

Figure 4 - 8. Individuals with a Disability, Montachusett Region



Source: American Community Survey (2013-2017) 5-Year Estimates

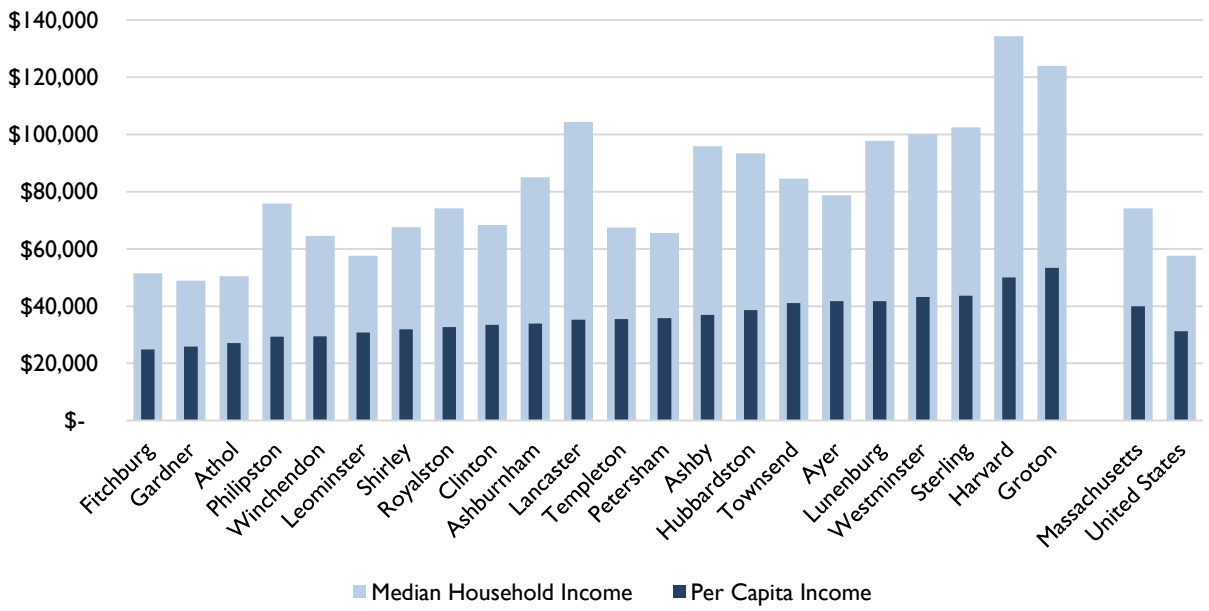
MART currently offers ADA Eligible Paratransit Service to transportation-disabled individuals. Service is provided by lift-equipped vans and is available in the areas that MART provides fixed route bus service. Under the ADA regulations, there are three categories of persons who are eligible for ADA Paratransit Service:

1. Is unable as a result of physical or mental impairment, to get on, ride, or get off an accessible vehicle on the public transit system: or
2. Needs the assistance of a wheelchair lift or other boarding assistance device and is able, with such assistance to get on, ride and get off an accessible vehicle, but such vehicle is not available on the route when the individual wants to travel; or
3. Has specific impairment-related condition including vision, hearing or impairments causing disorientation which prevents travel to or from a station or stop on the system.

Income

The ACS collects income and poverty data, and presents both across a range of different categories, including age, gender, race, family structure, occupation, etc. The ACS defines per capita income as the mean money income received in the past 12 months computed for every man, woman, and child in a geographic area. It is derived by dividing the total income of all people 15 years old and over in a geographic area by the total population in that area. (Note: income is not collected for people under 15 years old, even though those people are included in the denominator of per capita income. This measure is rounded to the nearest whole dollar.). In addition to per capita income, median household income is presented here in Figure 4 - 9 for each Montachusett community, as well as the state and nation.

Figure 4 - 9. Per Capita Income and Median Household Income



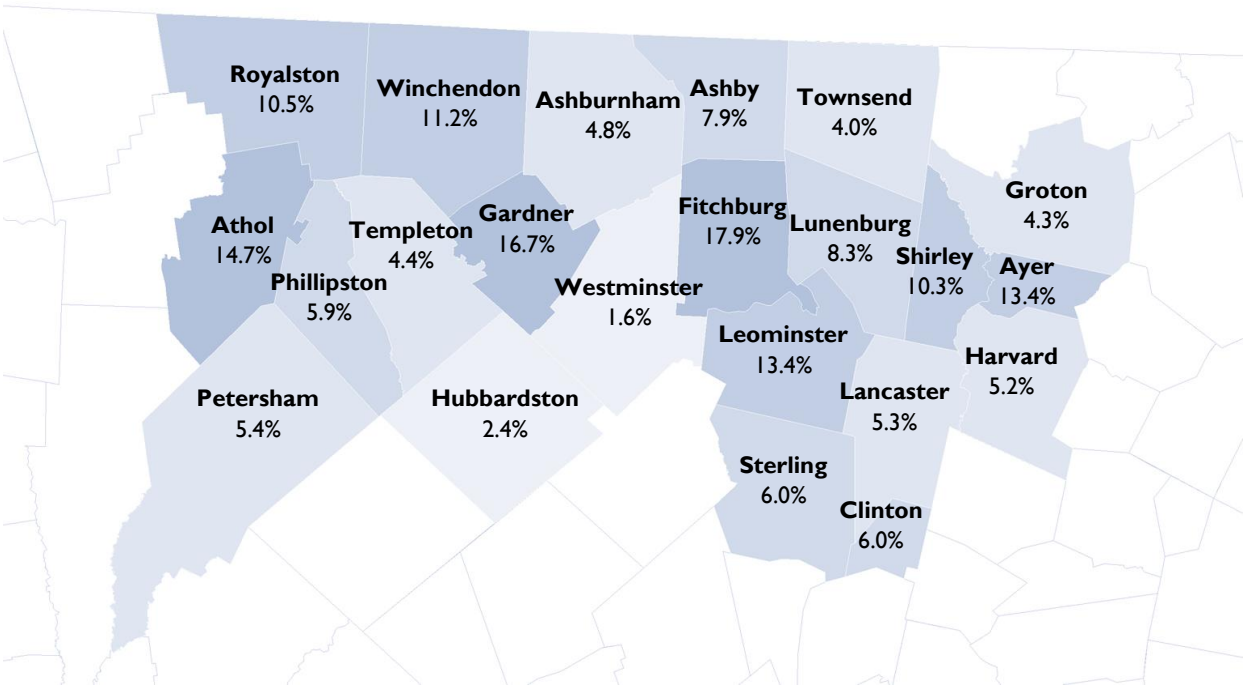
Source: American Community Survey (2013-2017) 5-Year Estimates

Fifteen (15) of the region's 22 communities have a lower per capita income than the state ($39,913), while nine rank below the state when examining median household income (Figure 4 - 9).

Poverty

Poverty is calculated as a percentage of the population below the poverty threshold. The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, that family and every individual in it is considered to be in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps).

Figure 4 - 10. Individuals Living in Poverty, Montachusett Region



Source: American Community Survey (2013-2017) 5-Year Estimates

An estimated 11.1% of individuals are living in poverty within the Commonwealth of Massachusetts. Six Montachusett communities have a higher concentration of poverty than the state as a whole, with Fitchburg (17.9%), Gardner (16.7%), and Athol (14.7%) also exceeding the

national poverty rate of 14.6% (Figure 4 - 10). Between 2016 and 2017, poverty rates declined in the region at a quicker pace than both the state and nation (Table 4 - 2).

Table 4 - 2. Poverty Rates

Area	2016	2017	1-Year Change
Montachusett Region	11.9%	10.8%	-1.1%
Massachusetts	11.4%	11.1%	-0.3%
United States	15.1%	14.6%	-0.5%

Source: American Community Survey 5-Year Estimates

Title VI and Environmental Justice (EJ)

Transportation and social equity through Title VI and Environmental Justice (EJ) all play a key role in the quality of life in the region by shaping access to jobs, housing, services and recreational opportunities and is essential to addressing poverty, unemployment and other equal opportunity goals. It is based on the principle that all people have a right to be protected from harmful or burdensome investments/projects, to live in and enjoy a clean and healthful environment and ensure that these identified communities do not bear a disproportionate burden of obtrusive projects and also share in positive and beneficial investments.

Transportation and social equity are a civil and human rights priority and major goal for the Montachusett Region. It requires making investments that provide all residents - regardless of age, race, color, national origin, income or physical agility - with opportunities to work, shop, be healthy, and play.

Title VI was enacted as part of the landmark Civil Rights Act of 1964 and prohibits discrimination on the basis of race, color, sex and national origin in programs and activities receiving federal financial assistance. In 1994, Executive Order 12898 was issued by President Clinton. Its purpose

is to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The order is also intended to promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities' access to public information and public participation. The order also directs each agency to develop a strategy for implementing environmental justice.

Massachusetts Executive Order 552 was issued on November 25th, 2014 requiring state Secretariats to take action in promoting environmental justice (EJ). "Environmental Justice is based on the principle that all people have a right to be protected from environmental pollution, and to live in and enjoy a clean and healthful environment. Environmental justice is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits" (www.mass.gov) .

Annually, during the development of the Transportation Improvement Program (TIP) and the Unified Planning Work Program (UPWP), an analysis is conducted on projects and work tasks to assess burdens and benefits on identified Title VI and EJ communities. For these analyses, the 2013-2017 American Community Survey 5-year estimates were utilized. For some of the data, census estimates were only available at the Census Tract level. This data dealt with Foreign Born, Disabilities and Non-English Spoken at Home. The remaining census data estimates were available at the Block Group level. The tables below list the ACS data sources as well as whether they were broken down to the Census Tract or Block Group level. These tables, therefore, were used to determine Environmental Justice (EJ) and Title VI designated areas.

Table 4 - 3. ACS Table Sources

Source: 2013-2017 ACS 5-Year Estimates By Block Group

Variable	2013-2017 ACS Table No.
Total Population	B03002
Majority Population	B03002
Poverty Determined Population	B17021
Below Poverty Population	B17021
Population 65 Years or Older Population	B09020
Median Household Income	B19013
Limited English Proficiency (LEP) Households	C16002

Source: 2013-2017 ACS 5-Year Estimates By Census Tract

Variable	2013-2017 ACS Table No.
Total Population	B05002
Foreign Born	B05002
Individuals with Disabilities	S1810
Percent Household Limited English Proficiency (LEP)	S1602
Percent Language Spoken at Home – Non-English	DP02

Environmental Justice (EJ) and Title VI populations are defined differently by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). In addition, EJ analysis is based on different criteria, ex. poverty based on the statewide median income rather than the regional median income. The tables below define the Title VI and EJ criteria utilized in the regional analysis.

Table 4 - 4. Environmental Justice and Title VI Definitions for Analysis

Environmental Justice Block Groups	Analysis Criteria
1. Block group whose annual median household income is equal to or less than 65 percent (%) of the statewide median ($74,167 in 2017);	Statewide Median Income: $74,167 65% of Median Household Income: ***$48,209*** Geography: ***Block Group***
2. Twenty-five percent (25%) or more of the residents identifying as minority;	Minority Population Equal or Greater Than ***25%*** Geography: ***Block Group***
3. Twenty-five percent (25%) or more of the households having no one over the age of 14 who speaks English as their primary language or have a limited ability to read, speak, write, or understand English - Limited English Proficiency (LEP).	Limited English Proficiency Equal or Greater Than ***25%*** Geography: ***Block Group***

FTA Title VI Communities	Analysis Criteria
1. Minority – Percent of population including Hispanic or Latino of any race that is considered non-white and is higher than the regional average	Regional Average: ***12.24%*** Geography: ***Block Group***
2. Low Income - Percent estimated below poverty level that is higher than the regional average	Regional Average: ***10.85%*** Geography: ***Block Group***

FHWA Title VI Communities	Analysis Criteria
1. Elderly – Percent of Total Population > 65 that is higher than the regional average	Regional Average: ***15.11%*** Geography: ***Block Group***
2. Individuals with Disabilities – Percent of population with a disability that is higher than the regional average	Regional Average: ***12.03%*** Geography: ***Census Tract***
3. Minority – Percent of population including Hispanic or Latino of any race that is considered non-white and is higher than the regional average	Regional Average: ***12.24%*** Geography: ***Block Group***
4. Foreign Born – Percent of population that is Foreign Born and is higher than the regional average	Regional Average: ***8.12%*** Geography: ***Census Tract***
5. Language – Percent of Population Spoken Language Other than English that is higher than the regional average	Regional Average: ***14.42%*** Geography: ***Census Tract***

Table 4 - 5 summarizes the populations for the Montachusett Region as a whole for the defined Title VI and EJ communities.

Table 4 - 5. Title VI and EJ Populations – Montachusett Region

		EJ Block Groups			FTA Title VI Block Groups		FHWA Title VI Block Groups		FHWA Title VI Census Tracts		
		Income	Minority	LEP HH	Minority	Low Income	Elderly	Minority	Disabilities	Foreign Born	Language
1	Total Regional Population	242,671	242,671	91,041 (HH)	242,671	233,995	242,671	242,671	242,671	242,671	242,671
2	Total Regional EJ/Title VI Population	N/A	29,695	2,322 (HH)	29,695	25,377	36,671	29,695	29,194	19,710	34,985
3	Percent of Total Regional EJ/Title VI Population vs. Total Regional Population	N/A	12.24%	2.55%	12.24%	10.85%	15.11%	12.24%	12.03%	8.12%	14.42%

NOTE: Figures listed as N/A due to the different criteria used by FTA and FHWA to define Low Income populations. Thus, a specific count cannot be calculated. The FTA definition is based on a regional average while FHWA is based on the statewide median income.

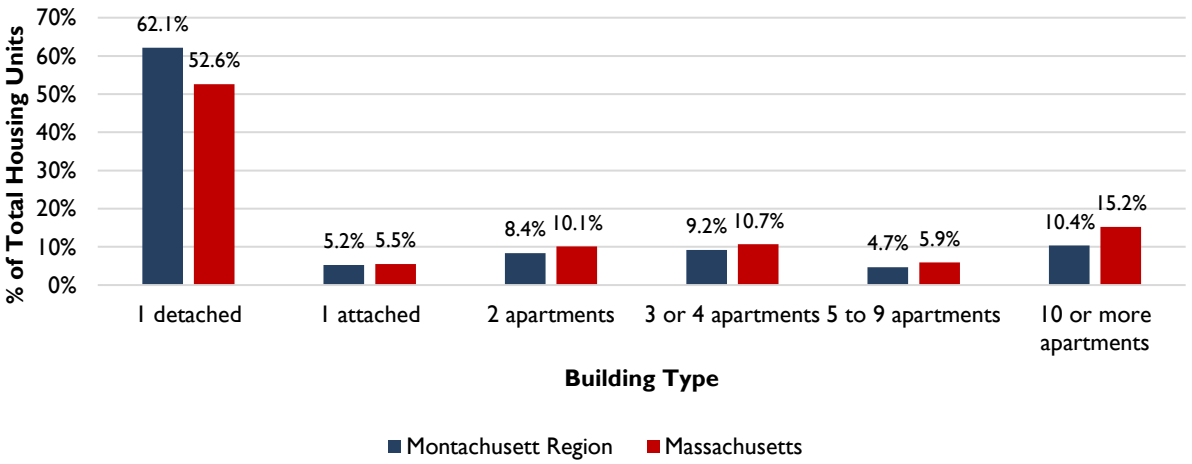
Housing Characteristics

To serve their aging populations as well as attract young professionals and working families, Montachusett communities will need to offer a variety of housing options. For many individuals, housing needs changes over a lifetime as household size and income decreases. Ensuring

available housing near importance services (e.g. healthcare facilities, public transit, grocery stores) becomes more important as the ability and willingness to drive may decrease as well. Balancing the housing needs of seniors, students, and working families and individuals of all ages represents an ongoing challenge for each of our 22 communities.

Like the state as a whole – but to an even further degree – the majority of housing units in the Montachusett Region are single detached units (Figure 4 - 11).

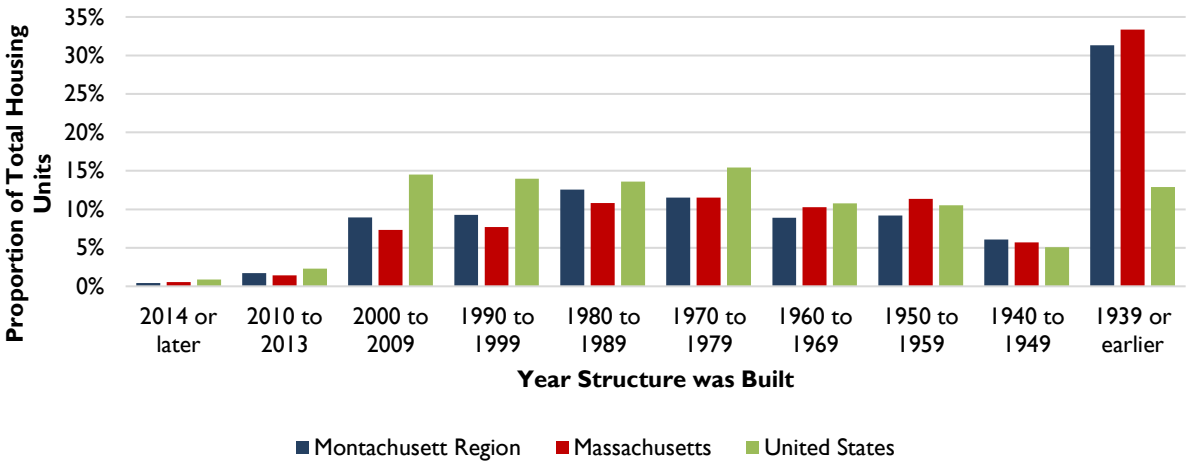
Figure 4 - 11. Housing Units by Building Type



Source: American Community Survey (2013-2017) 5-Year Estimates

The ages of homes in the Montachusett Region are akin to much of New England, with nearly a third of all homes having been built prior to the second World War (Figure 4 - 12). All homes built prior to 1978 (when lead-based house paint was discontinued in the United States) are likely to contain some levels of lead. Today, the Massachusetts Lead Law requires the removal or covering of lead paint hazards in homes built before 1978 where any children under six live, regardless of their blood lead level.

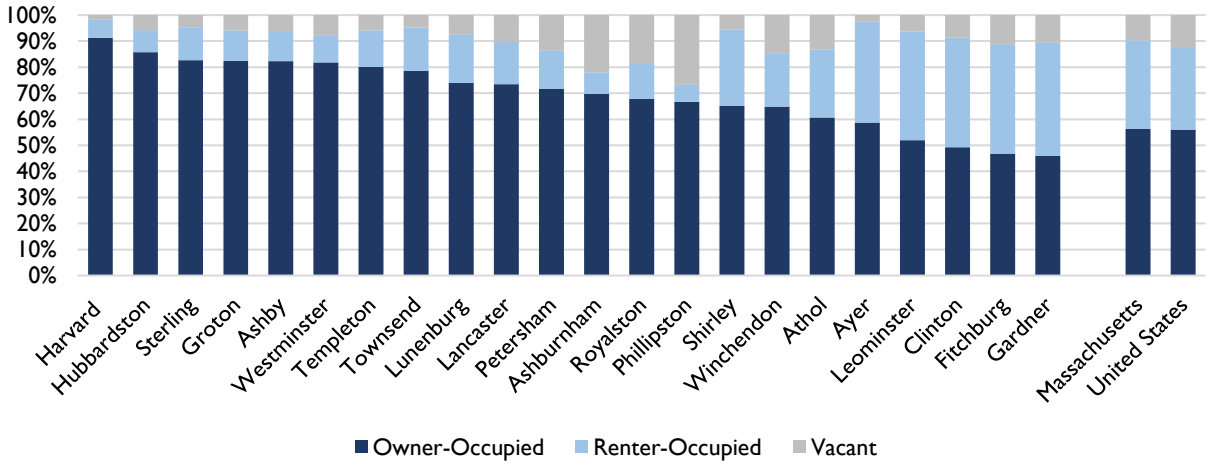
Figure 4 - 12. Proportion of Total Housing Units by Year Structure Was Built



Source: American Community Survey (2013-2017) 5-Year Estimates

Housing occupancy is highly variable between communities in the region (Figure 4 - 13), with homeowner occupancy ranging from as high as 91% in Harvard to as low as 46% in Gardner (compared to 56% in both the state and the nation).

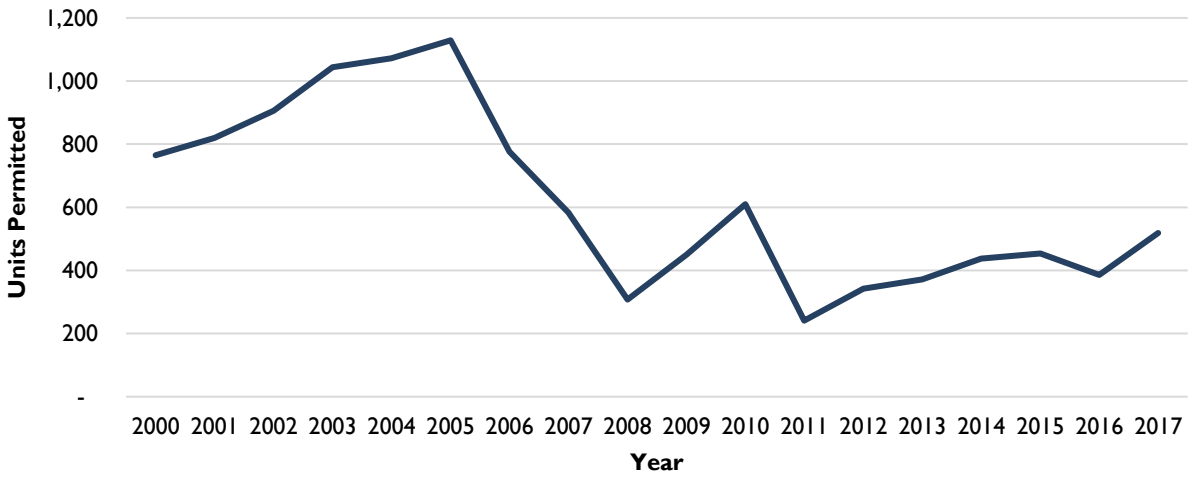
Figure 4 - 13. Housing Occupancy Status



Source: American Community Survey (2013-2017) 5-Year Estimates

In 2010, the region witnessed a spike in housing production which helped break the trend of declining construction which began in 2005 (Figure 4 - 14).

Figure 4 - 14. Number of Housing Units Permitted in the Montachusett Region (2000 to 2017)



Source: US Census Bureau – Annual Building Permit Survey

More than half of the building units permitted in 2010 were concentrated in the community of Lunenburg who supported the production of 308 units that year (of the total 610 in the entire region), including seven housing complexes with an estimated 186 total housing units.

It is generally accepted that a household can afford a home valued up to 30% of the household's annual income before becoming "cost burdened". Those households who pay a higher percentage of their income on housing may – according to the US Department of Housing and Urban Development – "have difficulty affording necessities such as food, clothing, transportation, and medical care". An estimated 19,464 owner-occupied households and 12,866 renter-occupied households are cost burdened throughout the Montachusett Region (Table 4 - 6).

Table 4 - 6. Cost Burden Severity by Community and Housing Occupancy

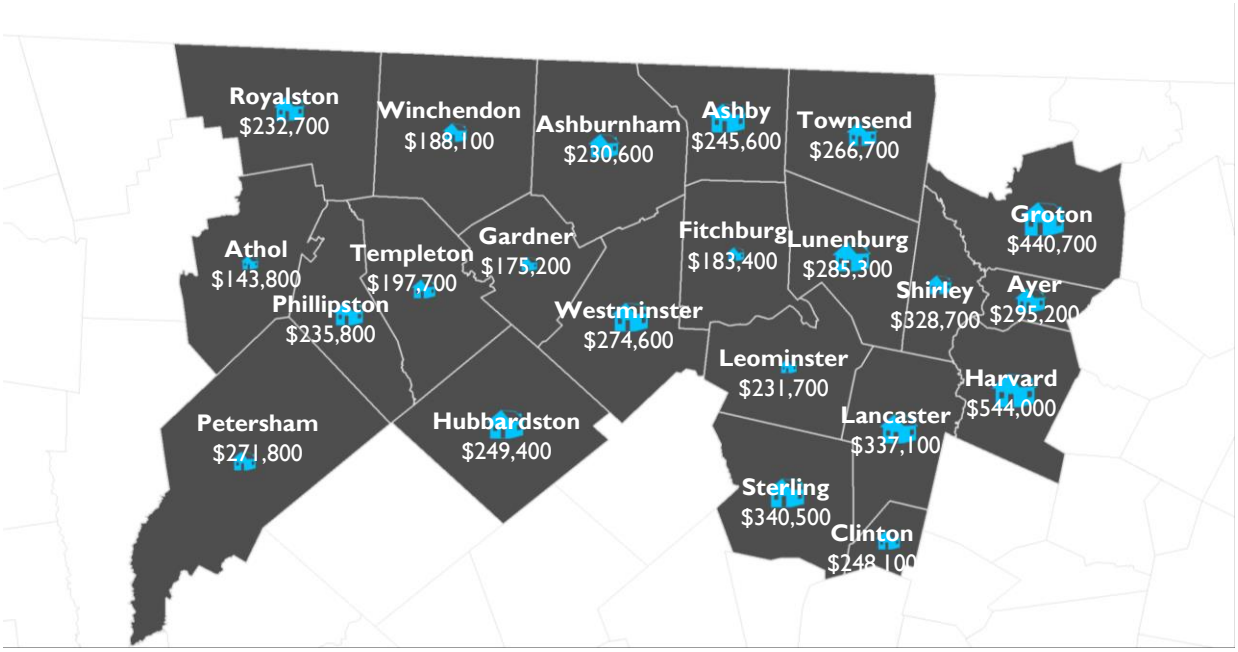
Community	Number of owner-occupied households that are cost burdened	% of owner-occupied households that are cost burdened	Number of renter-occupied households that are cost burdened	% of renter-occupied households that are cost burdened
Ashburnham	762	38.3	32	26.2
Ashby	352	35.1	23	42.6
Athol	927	27.8	634	52.5
Ayer	621	33.6	689	51.2
Clinton	1,132	32.2	911	42.3
Fitchburg	3,016	35.8	3,433	56.4
Gardner	1,480	34.1	1,464	43.8
Groton	908	27.1	121	26.8
Harvard	499	28.5	65	55.6
Hubbardston	314	23.1	135	93.1
Lancaster	578	29.6	168	47.6
Leominster	2,945	31.8	3,466	48.9
Lunenburg	1,144	32.5	280	46.7
Petersham	121	30	25	54.4
Phillipston	151	25.9	5	100
Royalston	107	26.8	15	32.6
Shirley	636	42.2	275	41.9
Sterling	709	28.9	205	71.9
Templeton	602	25.6	173	41.1
Townsend	792	29.4	238	41.4
Westminster	775	31.9	114	33.8
Winchendon	893	30.2	395	42.1

Source: Housing.MA

Almost twenty-eight percent (27.9%) of owner-occupied households are considered cost-burdened throughout Massachusetts; all but six communities in the Montachusett region exceed this figure. Although fewer total renters experience being cost burdened when compared to homeowners, their rate of burden is significantly higher. Specifically, 47.4% of renter-occupied households spend more than 30% of their income on living expenses across the state, while 10 of 22 Montachusett communities exceed this rate.

Another indicator of housing affordability is the median home value of the region. As a general trend, housing values are highest along the eastern edge of the Montachusett Region in those communities with greatest accessibility to Boston and major employment centers (Figure 4 - 15).

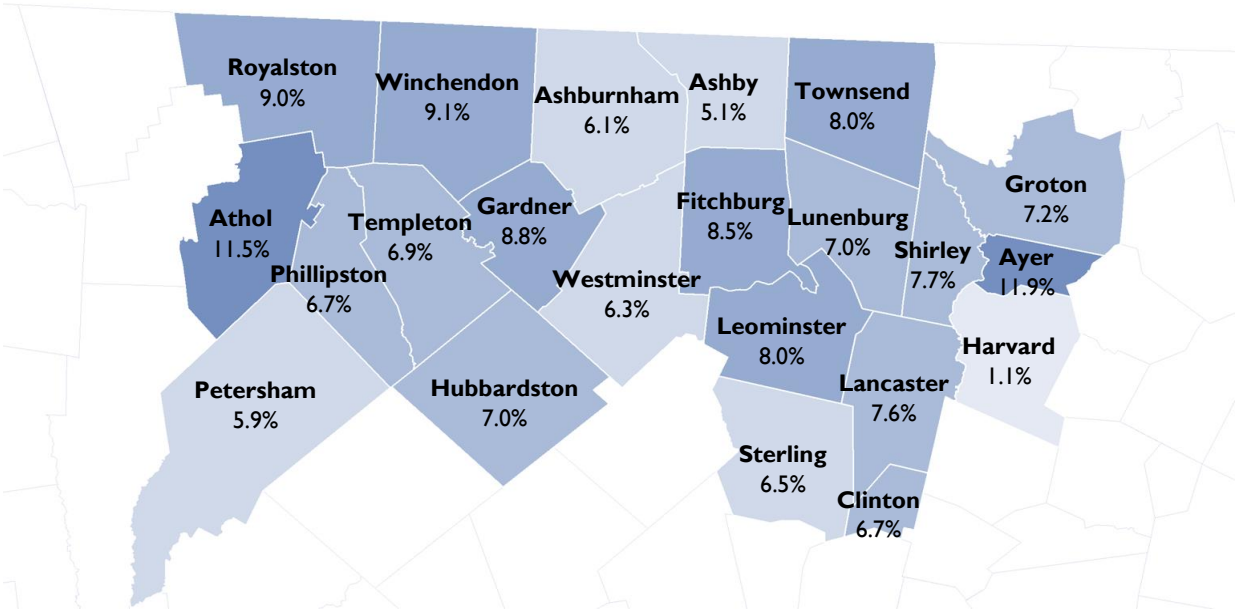
Figure 4 - 15. Median Household Value for Owner-Occupied Households



Source: American Community Survey (2013-2017) 5-Year Estimates

To project future household values, Zillow.com compiles the past six years of home sales data and forecasts ahead a single year (Figure 4 - 16). Housing values are projected to increase in every Montachusett community over the next year; in particular, Ayer (11.9%) and Athol (11.5%) are expected to see dramatic changes in their housing markets in the near future.

Figure 4 - 16. One-Year Household Value Projections



Source: Zillow Research 2019

Labor Force and Employment

Labor force and employment data were collected and compared across multiple sources, including American Community Survey estimates, ESRI's Business Analyst Online (BAO), and Massachusetts Office of Labor and Workforce Development. Overall, despite significant disruptions since before 2000, manufacturing remains the largest (NAICS 2-digit) employment sector in the region (17% of total employees) and integral to the economic health of many communities.

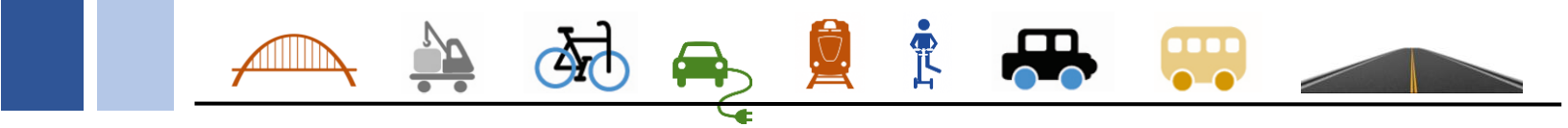


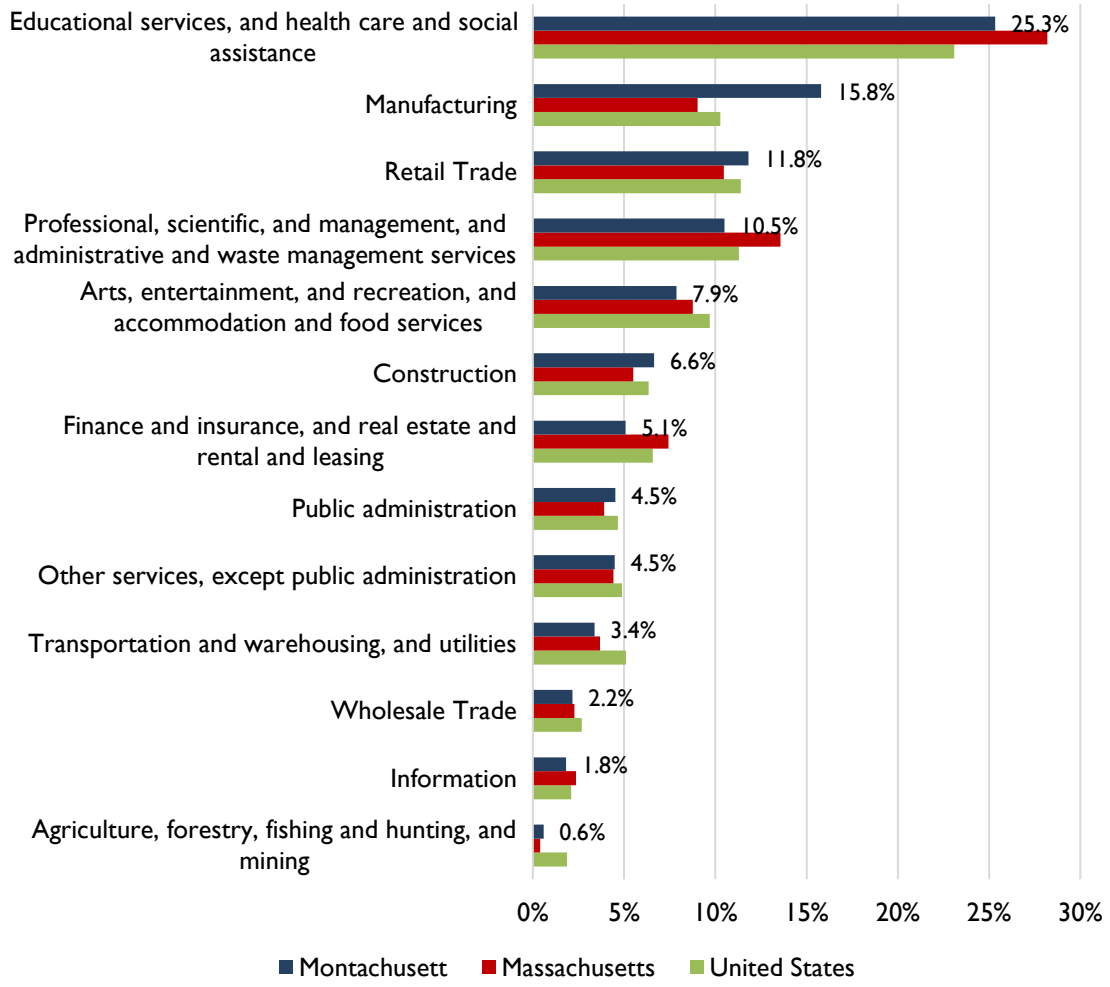
Table 4 - 7. Businesses and Employment by Industry (ESRI BAO 2019)

Industry	Businesses		Employees	
By NAICS Codes	Number	Percent	Number	Percent
Manufacturing	450	5.3%	16,175	17.0%
Health Care & Social Assistance	635	7.4%	13,826	14.5%
Retail Trade	1,155	13.5%	12,577	13.2%
Educational Services	273	3.2%	9,688	10.2%
Accommodation & Food Services	510	6.0%	8,192	8.6%
Public Administration	533	6.2%	5,808	6.1%
Other Services (except Public Administration)	1,316	15.4%	5,240	5.5%
Wholesale Trade	342	4.0%	4,924	5.2%
Construction	797	9.3%	3,910	4.1%
Professional, Scientific & Tech Services	611	7.1%	3,167	3.3%
Finance & Insurance	274	3.2%	2,228	2.3%
Transportation & Warehousing	155	1.8%	1,931	2.0%
Administrative & Support & Waste Management & Remediation Services	309	3.6%	1,850	1.9%
Real Estate, Rental & Leasing	389	4.5%	1,806	1.9%
Information	181	2.1%	1,514	1.6%
Arts, Entertainment & Recreation	149	1.7%	1,237	1.3%
Agriculture, Forestry, Fishing & Hunting	60	0.7%	297	0.3%
Utilities	25	0.3%	287	0.3%
Management of Companies & Enterprises	9	0.1%	227	0.2%
Unclassified Establishments	369	4.3%	154	0.2%
Mining	9	0.1%	104	0.1%
Total	**8,551**	**100.0%**	**95,142**	**100.0%**

Source: ESRI Business Analyst Online (BAO) 2019

When aggregated (as is done for the American Community Survey estimates), educational services, and health care and social assistance together represent the largest employing industry in the Montachusett Region, as we see in the state and nation as a whole.

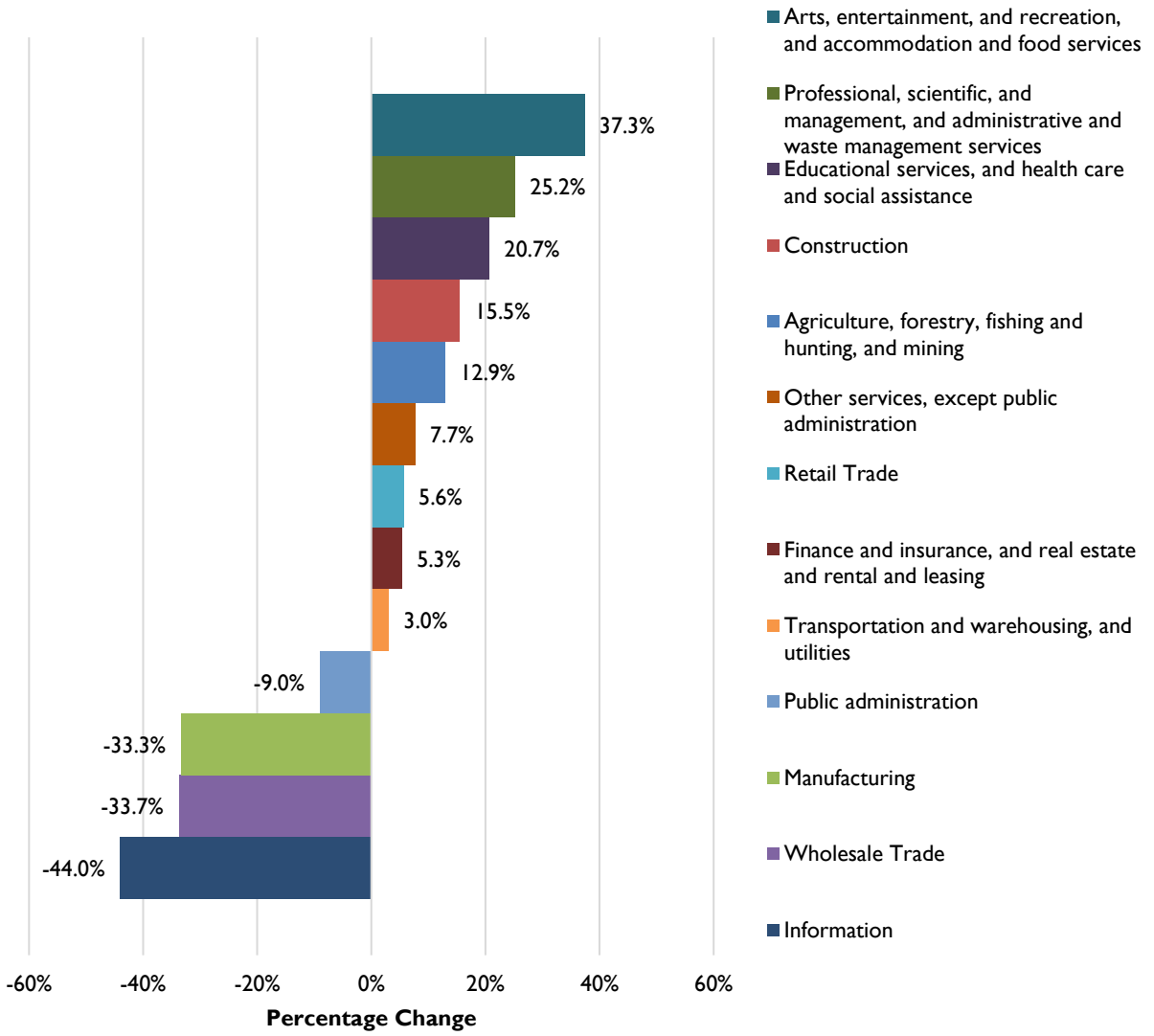
Figure 4 - 17. Employment by Industry



Source: American Community Survey (2013-2017) 5-Year Estimates

The level of manufacturing-based employment – despite declines in recent decades – continues to dwarf that of both the state and country. While efforts continue toward diversifying the regional economy into other growing sectors of the economy, including service sectors, the region's comparative advantage of an experienced manufacturing workforce and legacy industrial space will ensure manufacturing is maintained as a cornerstone in the region's economy.

Figure 4 - 18. Shift in Employment by Industry as a Share of the Regional Economy, Montachusett Region (2000 to 2017)



Source: US Census, American Community Survey (2013-2017) 5-Year Estimates

Between 2000 and 2017, the region witnessed some notable shifts in the total employment share by each industry. Arts, entertainment, and recreation, and accommodation and food services – although still modest in its total employment, with 9,544 jobs in 2017 – has increased its share of total employment in the region by 37.3% since 2000. Other industries which witness such a boost included professional, scientific, and management, and administrative and waste management services (25.2%,); educational services, and health care and social assistance (20.7%); and construction (15.5%).

While the greatest declines in total employment share occurred in the information (-44%) and wholesale trade (-33.7%) sectors, together these sectors are responsible for less than 4% of jobs in the region in 2017. Manufacturing, on the other hand, accounts for an estimated 15.8% of the region's employment and is down from 23.7% in 2000 (and a net loss of 7,063 jobs during that time).

According to the Massachusetts Executive Office of Labor and Workforce Development, the fastest growing occupation in the Montachusett Region is heating, air conditioning, and refrigeration mechanics and installers (see Table 4 - 8). Home health aides and personal care aides are also going to be needed in higher supply to help continue to meet the care needs of the region's growing senior population.

Table 4 - 8. Fifteen (15) Fastest Growing Occupations in the Montachusett Region

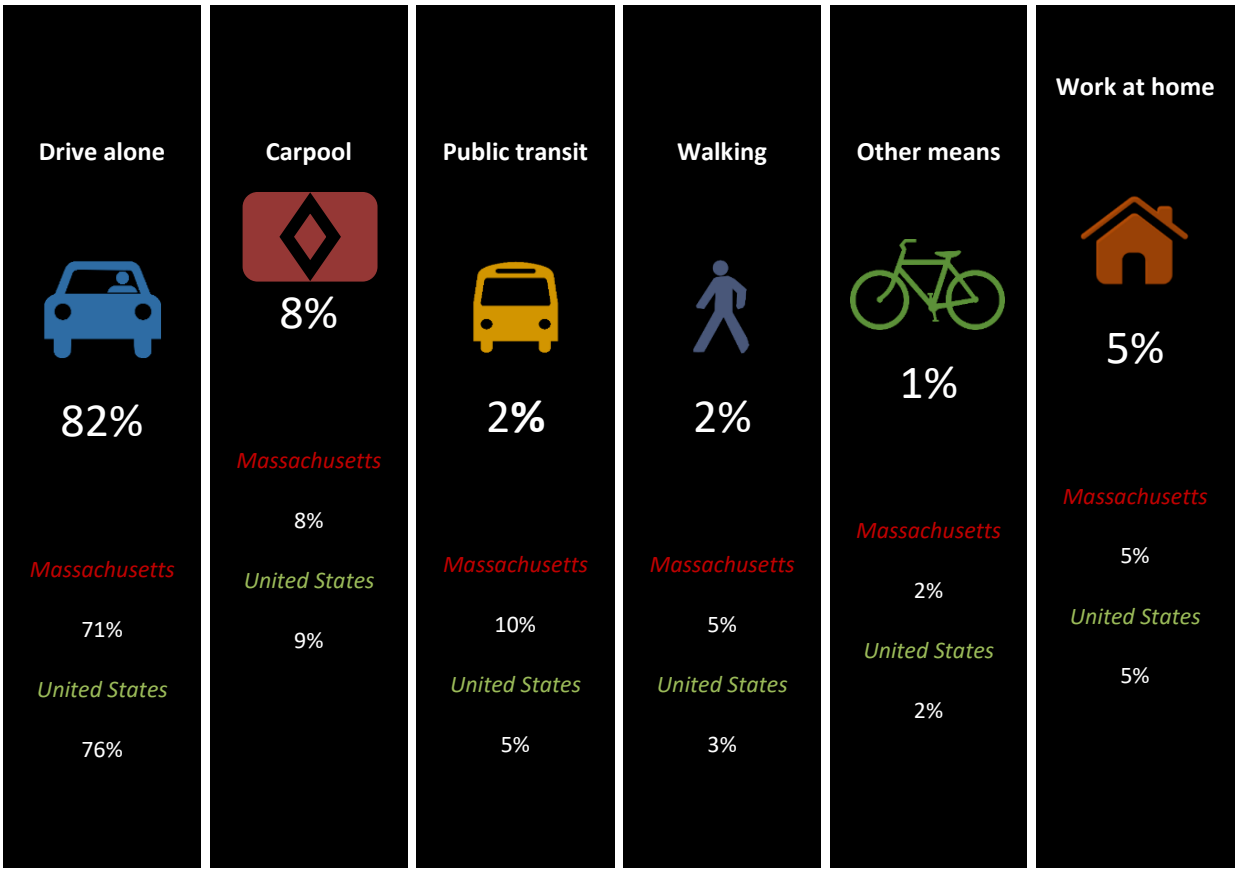
Title	Employees 2016	Projected Employees 2026	Numeric Change	Percent Change	2017 Mean Annual OES Wage
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	122	156	34	27.9%	$50,272
Home Health Aides	232	292	60	25.9%	$30,609
Personal Care Aides	1,924	2,404	480	24.9%	$28,198
Software Developers, Applications	210	252	42	20.0%	$95,582
Nonfarm Animal Caretakers	210	252	42	20.0%	$27,317
Market Research Analysts and Marketing Specialists	179	213	34	19.0%	$62,777
Mental Health and Substance Abuse Social Workers	180	214	34	18.9%	$36,639
Combined Food Preparation and Serving Workers, Including Fast Food	1,020	1,205	185	18.1%	$25,361
Financial Managers	296	345	49	16.6%	$93,419
Farmers, Ranchers, and Other Agricultural Managers	244	284	40	16.4%	–
Plumbers, Pipefitters, and Steamfitters	300	346	46	15.3%	$63,347
Self-Enrichment Education Teachers	128	147	19	14.8%	$39,451
Nurse Practitioners	161	184	23	14.3%	$128,176
Residential Advisors	352	399	47	13.4%	$31,980
Loan Officers	750	842	92	12.3%	$84,574

Source: Massachusetts Executive Office of Labor and Workforce Development 2018

Travel Means & Times

This section provides commuting information for workers aged 16 or over. This data comes from the American Community Survey (ACS) from the US Census Bureau.

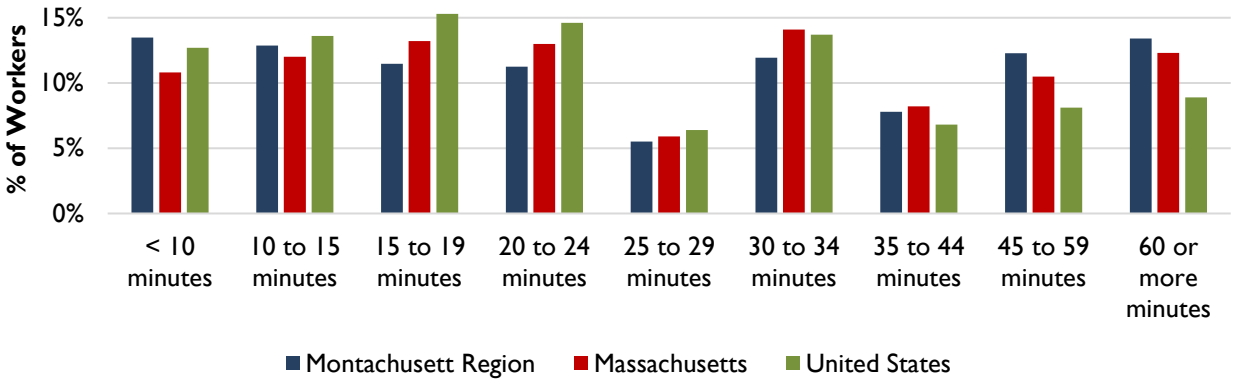
Figure 4 - 19. Means of Travel to Work, Montachusett Region



Source: American Community Survey (2013-2017) 5-Year Estimates

Montachusett Region commuters are more auto-reliant for than the state or nation, with 90% of workers either driving alone or carpooling to work (compared to 78% of workers in Massachusetts, and 85% of workers in the country). We also recognize Montachusett residents are significantly less reliant upon public transit and a few residents are able to walk to their place of employment.

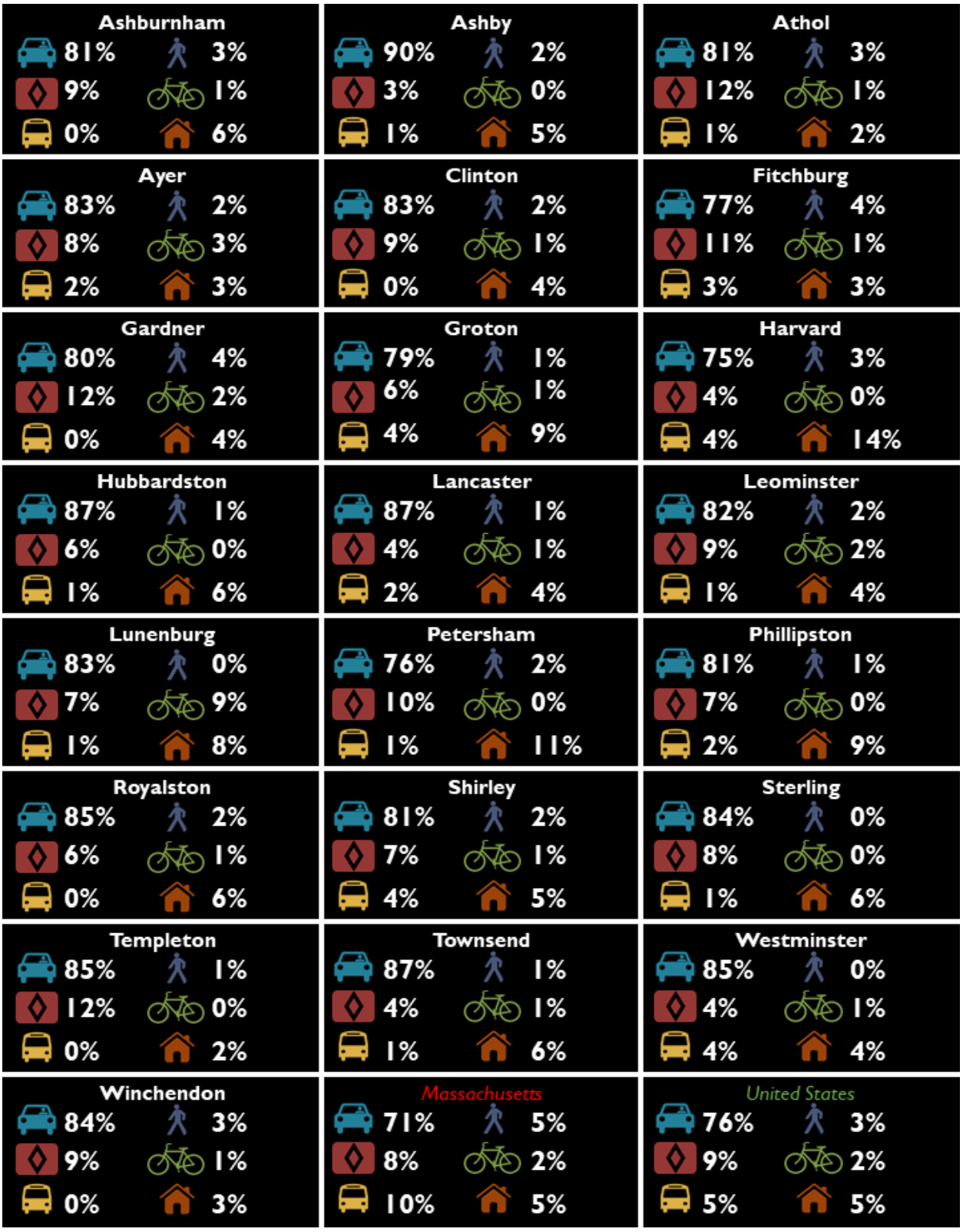
Figure 4 - 20. Travel Time to Work



Source: American Community Survey (2013-2017) 5-Year Estimates

Interestingly, a higher proportion of Montachusett residents have *both* less than a 10-minute and more than a 45-minute commute to their place of employment when compared to Massachusetts and the US.

Figure 4 - 21. Means of Travel to Work by Community



Source: American Community Survey (2013-2017) 5-Year Estimates

PROJECTIONS FOR THE MONTACHUSETT REGION

MassDOT worked with the UMass Donahue Institute (UMDI) to update and revised population, households and employment projections for the Commonwealth's MPOs for use in their 2020 RTP and the Statewide Transportation Planning Model developed and run by Central Transportation Planning Staff (CTPS) of the Boston Region MPO. Working with a Projection Advisory Committee that included UMDI, MassDOT, CTPS and the state's Regional Planning Agencies (RPAs), these projections were developed over a series of months.

As stated by UMDI in their report, Massachusetts Population Projections by Regional Planning Area, Projections Methodology:

> "It is important to note that modeled projections cannot and do not purport to predict the future, but rather may serve as points of reference for planners and researchers. Like all forecasts, the UMDI projections rely upon assumptions about future trends based on past and present trends which may or may not actually persist into the future. It is also a demographically-based model, assuming that population change is driven by births, deaths, and the persistence of historic migration rates into the future."

For a more detailed discussion regarding the development and methodology employed by UMDI to develop these demographic projections, please contact the MRPC.

Methodology

The following summarizes the methodology employed by UMDI and reviewed by the Projections Advisory Committee. It is derived from a presentation conducted by UMDI entitled "Long-Term Population Projections for Massachusetts Regions - Method Overview, Recent Updates, and the Components of Change in Massachusetts, September 2018."

The following steps were conducted:

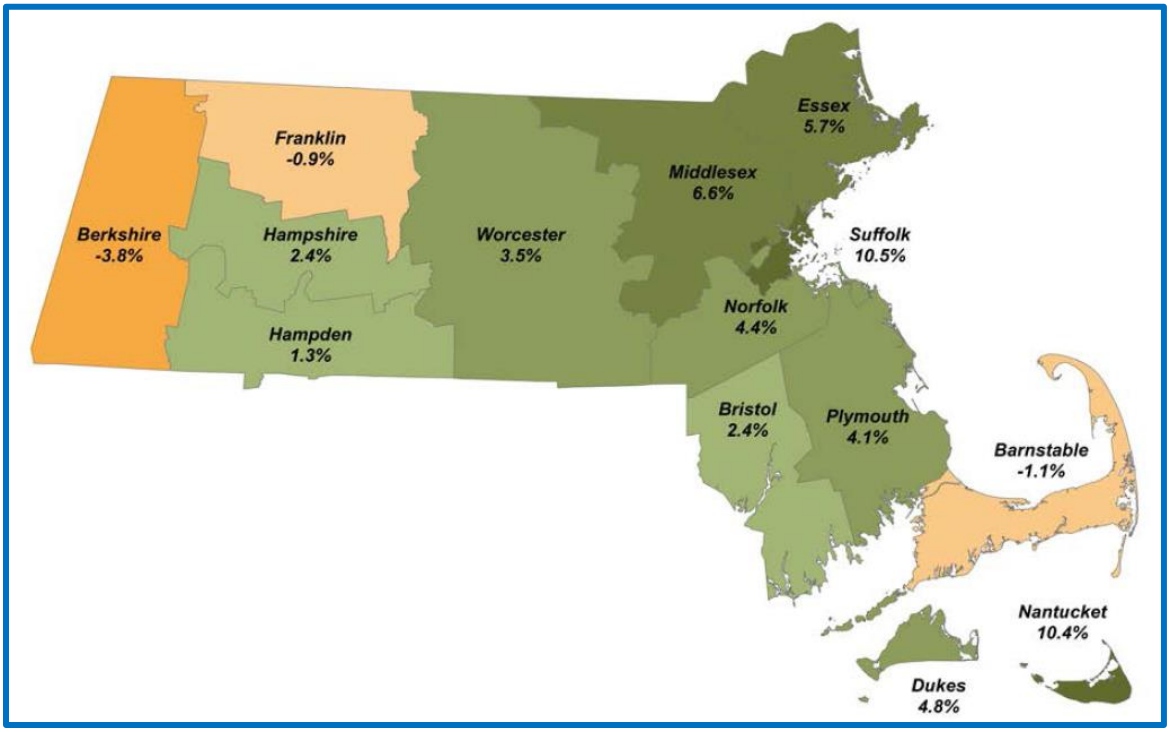
1. Massachusetts Population Growth
2. Population Projections Method Overview

3. Updating the Model
4. Results by MPO Region
5. Regional Variation
6. Statewide Results Summary

Massachusetts Population Growth Snapshot

- Massachusetts has been growing twice as fast this decade compared to last.
  - 0.3% average annual growth between 2000 and 2010
  - 0.7% average annual growth between 2010 and today
- From 2000 to 2010, Massachusetts population increased by 198,516 –or 3.1% total.
- Since Census 2010, Massachusetts population has already increased by 312,011, or 4.8% cumulatively.

Figure 4 - 22. Estimated Percent Change in Population by Massachusetts County April 1, 2010 to July 1, 2017

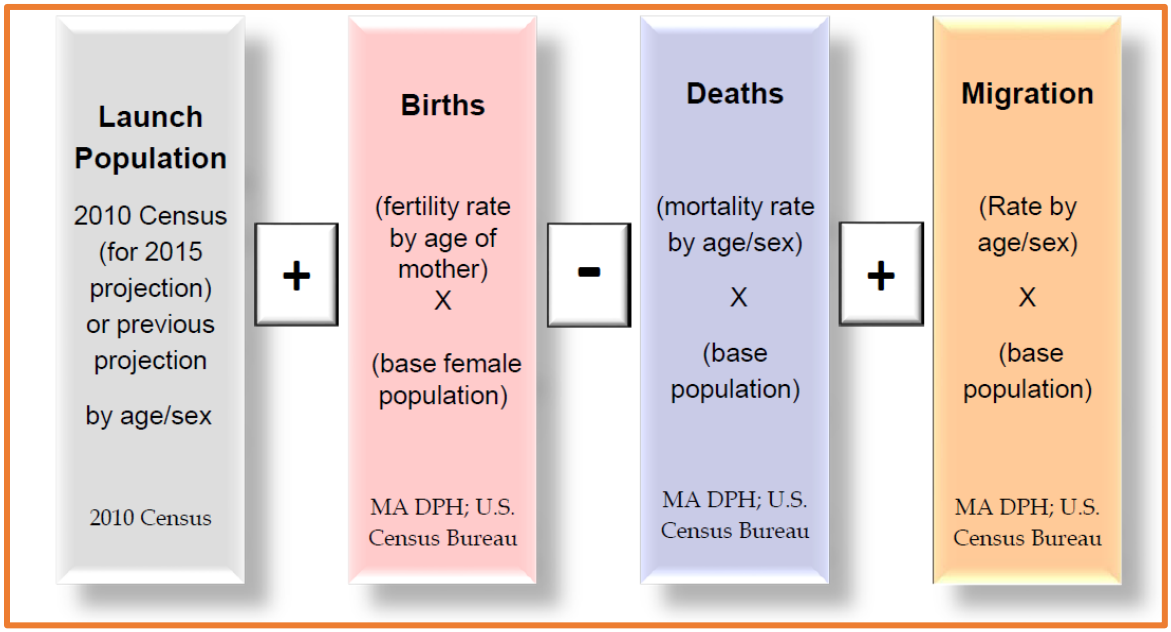


Source: Long-Term Population Projections for Massachusetts Regions, UMDI

Population Projections Method Overview

- Cohort-Component Method
  - A demographic accounting framework for modelling population change
  - For each age/sex/geography cohort:

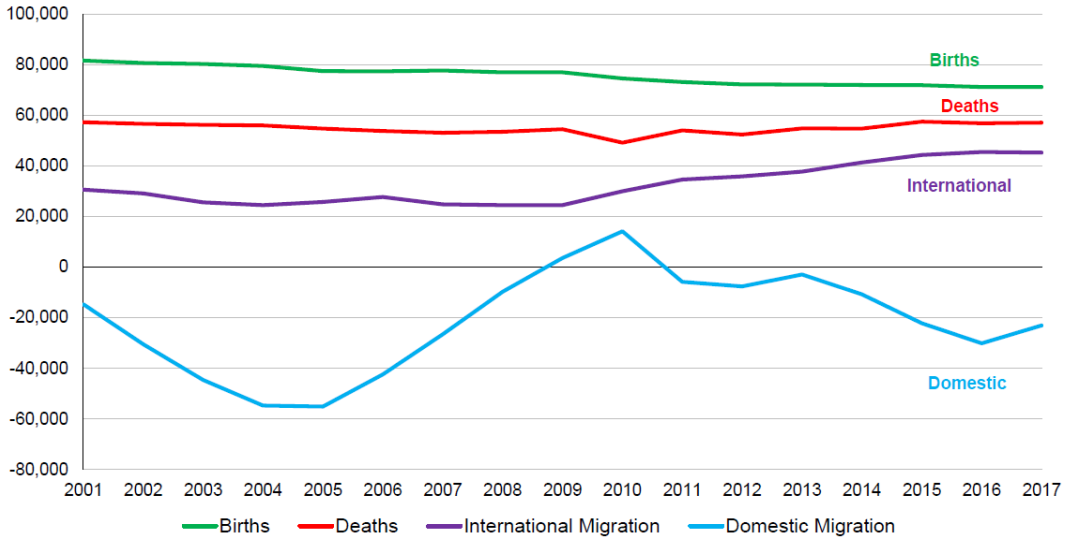
Figure 4 - 23. Cohort Projection Methodology



"Cohort" refers to age/sex group for a particular geography, for example, the number of 5-9 year old females in Cambridge.

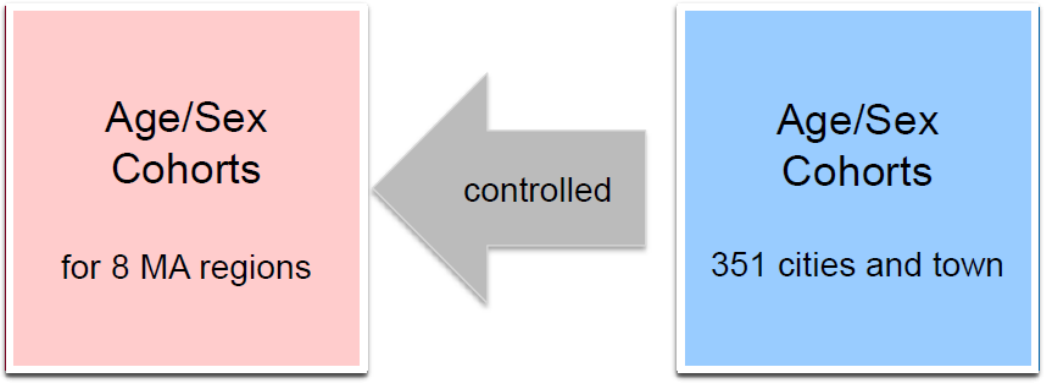
- Components of Change

Figure 4 - 24. Massachusetts Components of Change 2000-2017



ST-2000-7; CO-EST2010-ALLDATA; and NST-EST2017-ALLDATA, U.S. Census Bureau Population Division

- Method Overview
  - Population projections developed at 2 levels



  - Both levels are estimated using a *cohort component* approach.
  - Difference is in how migration is modelled.

Population Projections Method Overview

- Updates to UMDI V2015 Population Projections
  - **Reset the 2015 launch populations** to align with Census Bureau's 2017 released population estimates by age/sex/county for 2015

- **Fertility rates:** Updated regional rates-by-age according to percentage change observed in state rates-by-age from old period (2005-2009) to latest period (2011-2015)
- **Death rates**: Updated regional rates-by-age according to percentage change observed in state rates-by-age from old period (2005-2009) to latest period (2011-2015)
- **Migration:** In and out migration rates by UMDI region maintained from 2005-2011 ACS data, with 2015 launch refreshed. (Because of issues with new MIGPUMA boundaries).

Results by MPO Region

Figure 4 - 25. Population Change by RPA Region 2010-2020

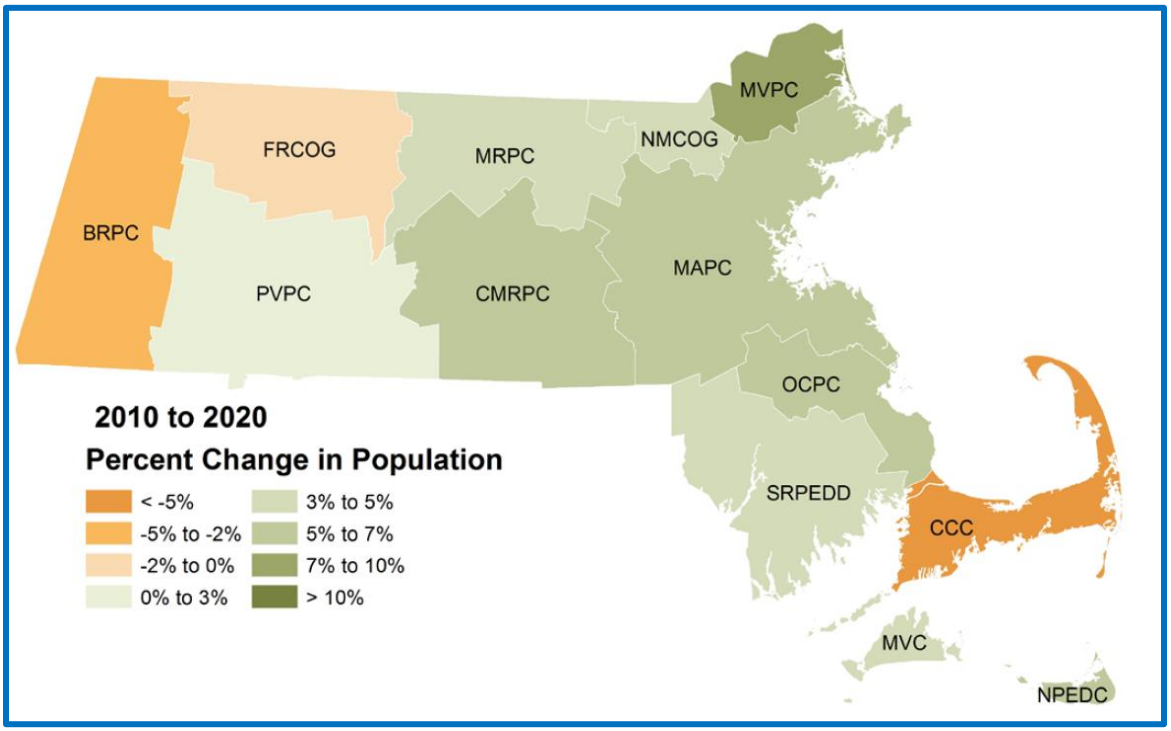


Figure 4 - 26. Population Change by RPA Region 2020-2030

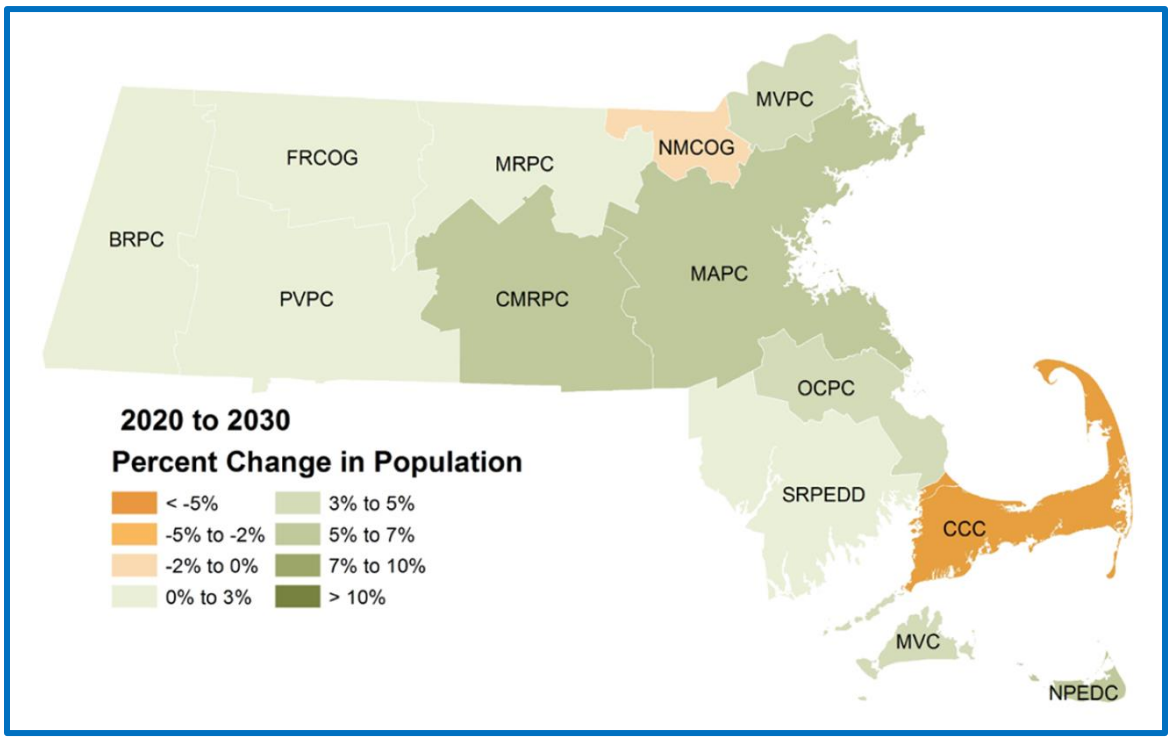
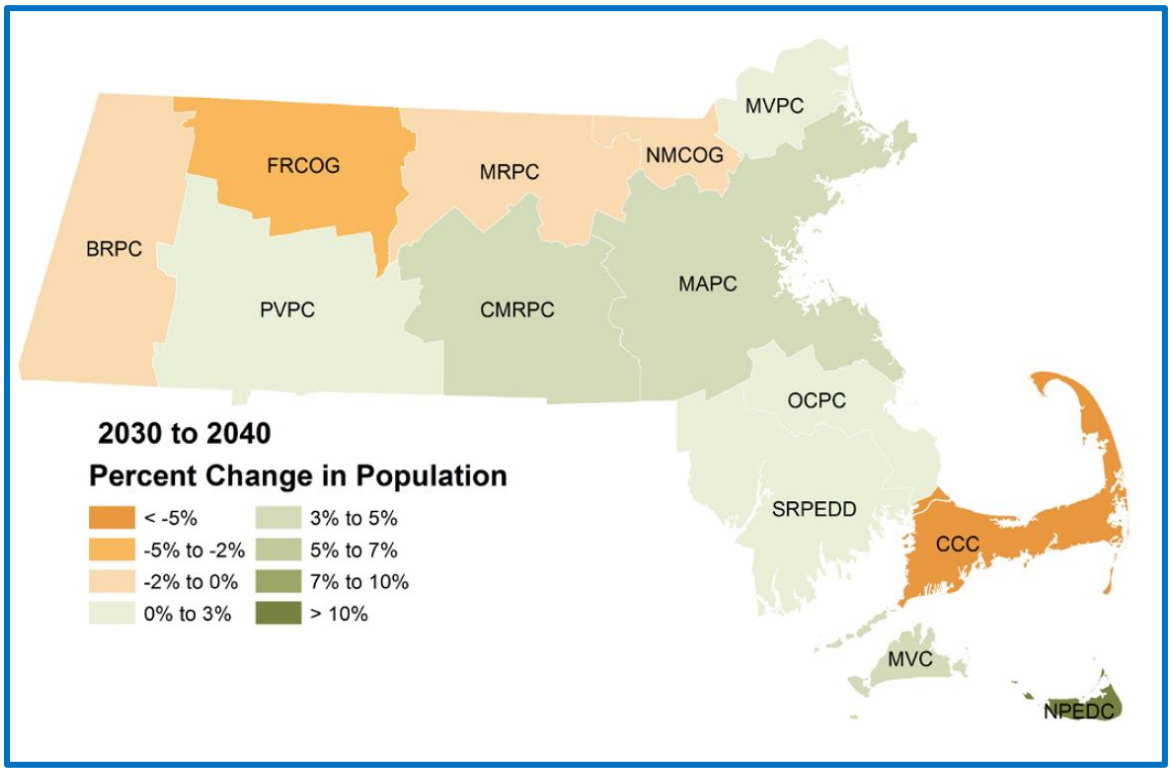


Figure 4 - 27. Population Change by RPA Region 2030-2040



Regional Variation

- Major Factors Influencing Regional Variation
    - Recent trends in migration by region are picked up in the model.
    - Age profile of each region varies considerably
    - Diversity varies around the state and relates to age profile, thus natural increase
    - In seasonal areas, most of the recent housing unit growth is confined to seasonal use, not adding resident population.
- Diversity and Age
    - A higher percentage of Hispanic population generally relates to a lower median age. •In Massachusetts the median age of the Hispanic population is 27.9 compared to 41.5 for the Non-Hispanic population.
    - At the county level, we see that Barnstable and Dukes County are the two oldest in Massachusetts in terms of median age and are also the two counties with the lowest percentage of Hispanic population.
    - The “youngest” county, Suffolk, has the second highest percentage of Hispanic population in Massachusetts.
    - Half (50.4%) of the nation’s children younger than five belonged to a minority population in 2016, with 25.8% identifying as Hispanic.
    - In Massachusetts, 41.0% of children younger than five belonged to a minority population and 20.4% were Hispanic.

Figure 4 - 28. Estimated Minority Population

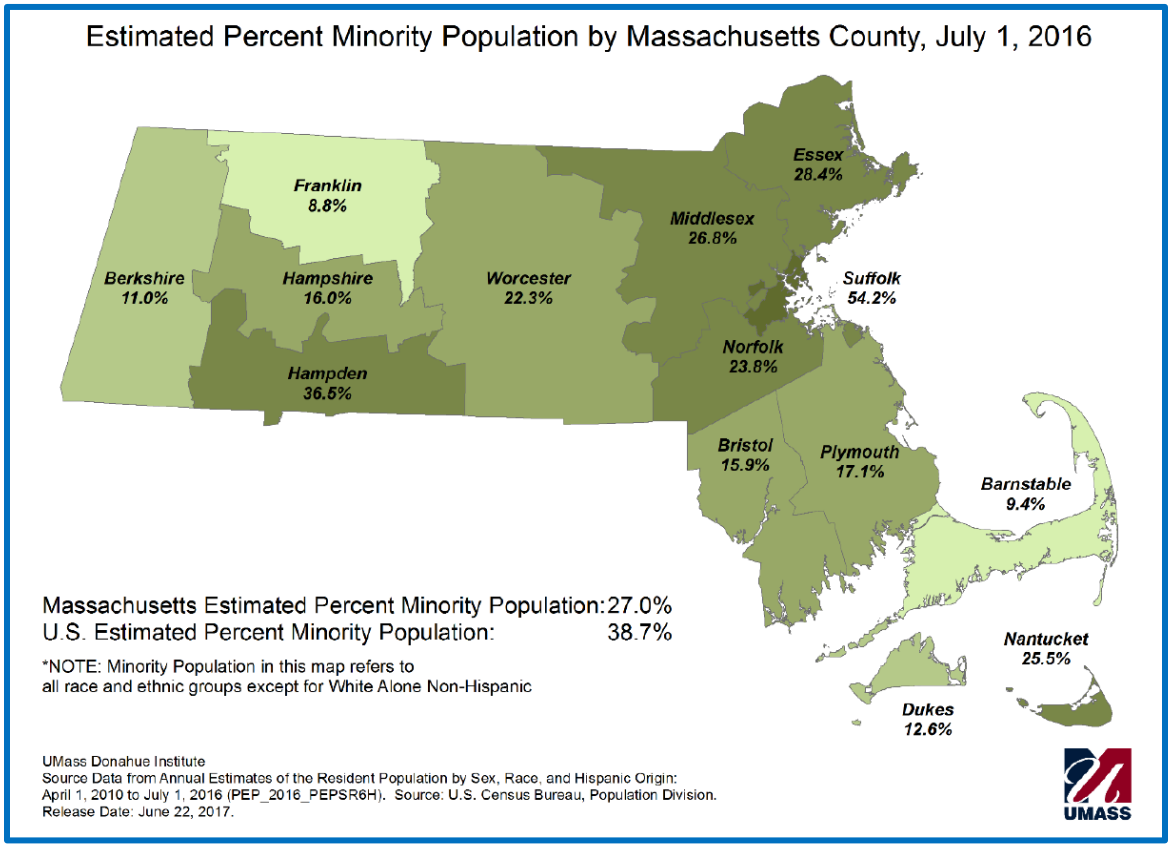
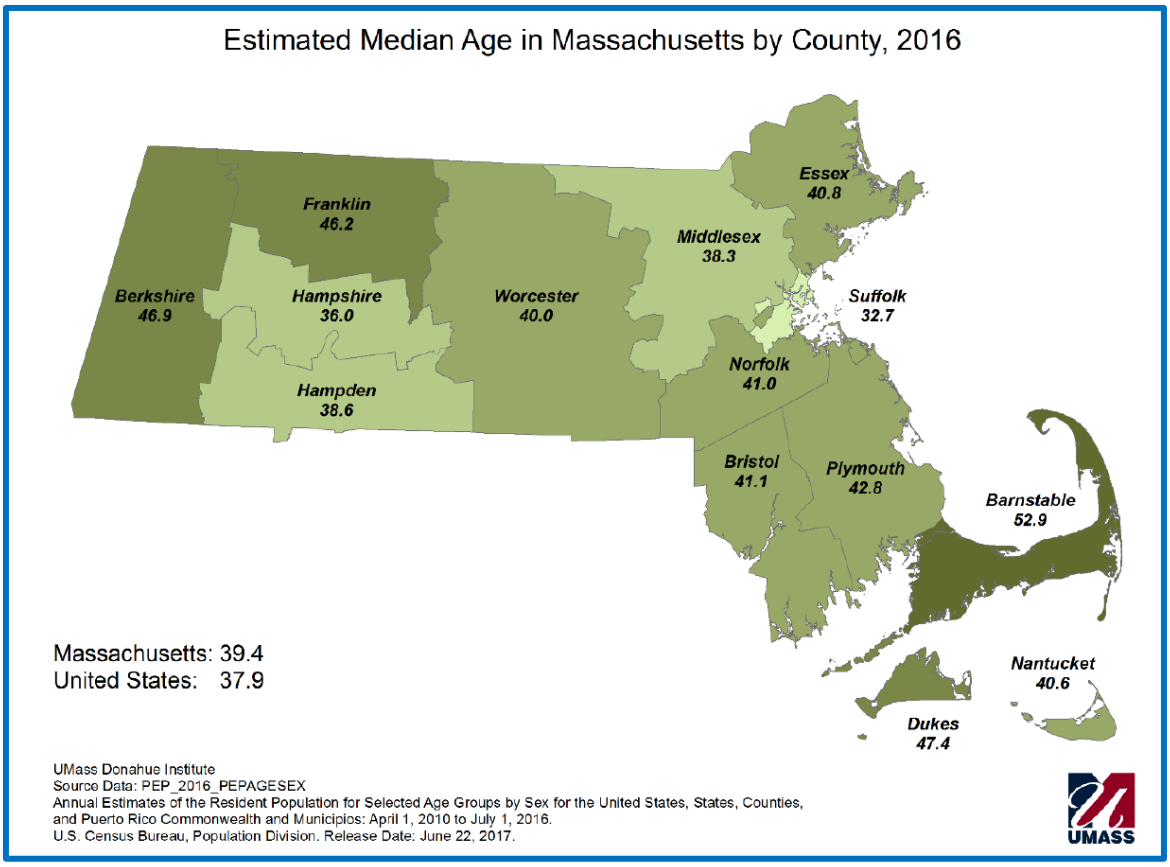


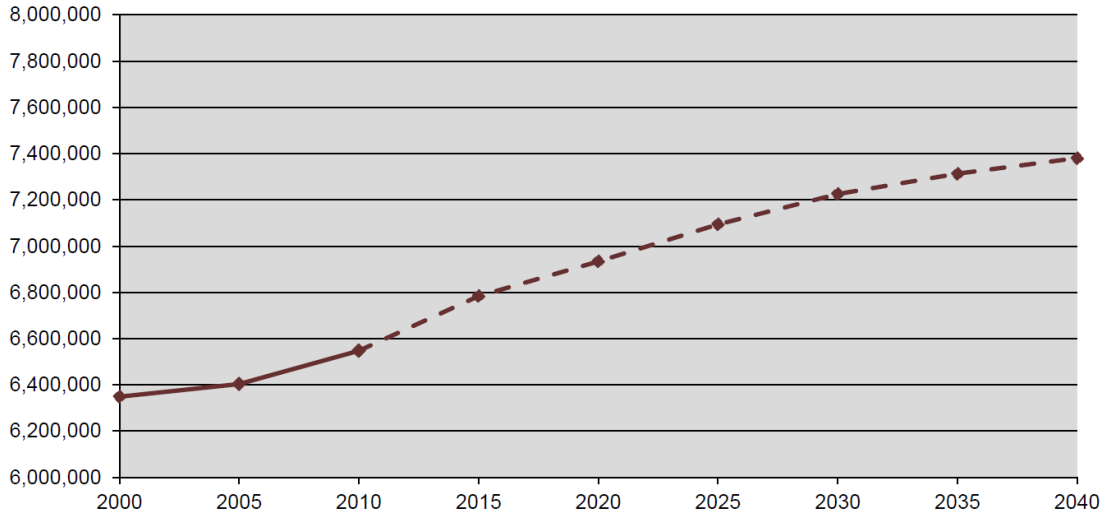
Figure 4 - 29. Estimated Median Age



Statewide Summary

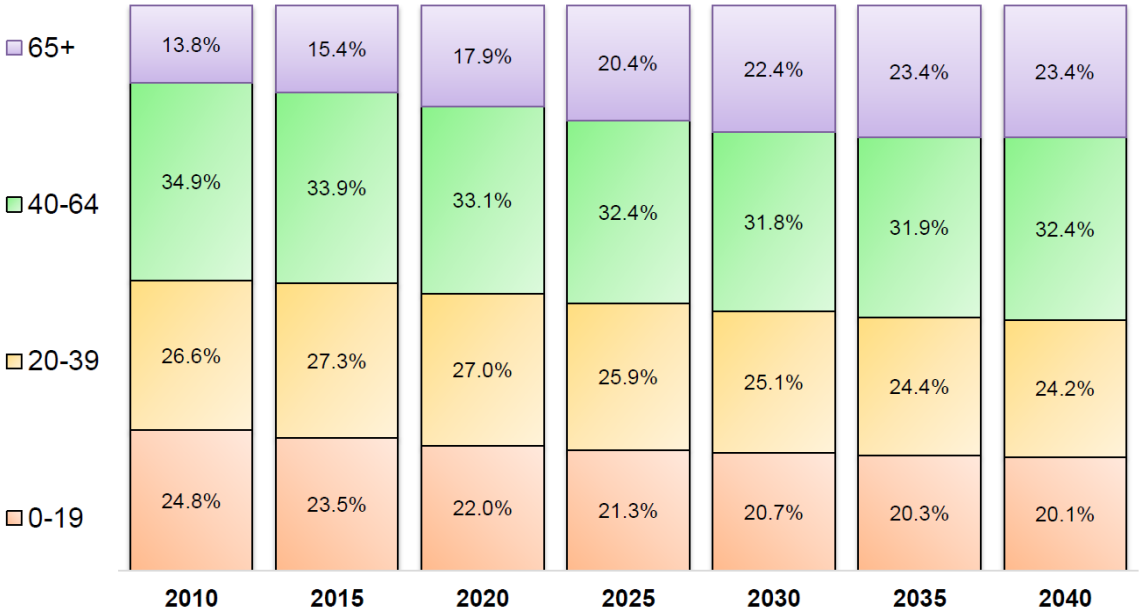
- Total State Population

Figure 4 - 30. Massachusetts Actual and Projected Population, 2000-2040



- Population by Age Group: Shifting Ratios

Figure 4 - 31. Massachusetts Projected Population Distribution by Age Group 2010-2040



Source Data: U.S. Census Bureau, 2010 Census Summary File 1; UMass Donahue Institute Population Projections 2018

Montachusett Region Projections

Based upon the work conducted by UMDI and MassDOT as outlined above, a series of projections were calculated for the Montachusett Region. These projections were provided as regional totals

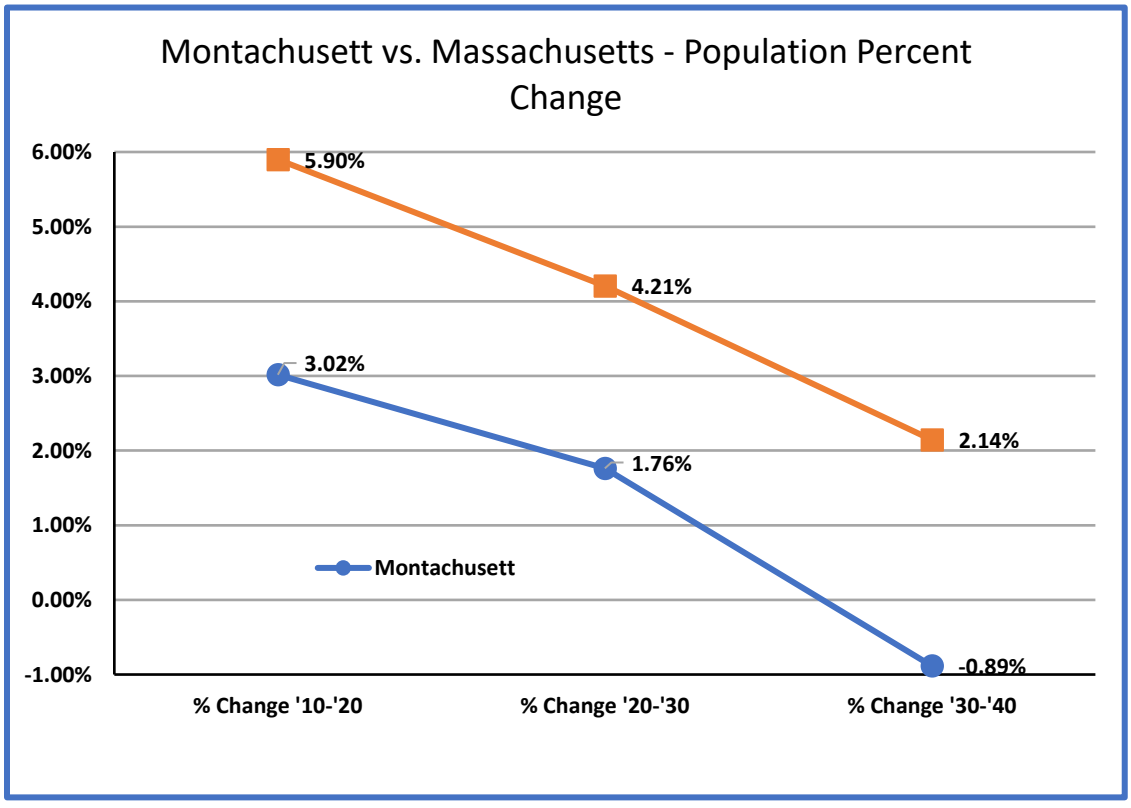
and then disaggregated to the 22 communities that comprise the region. This process was based upon past census data for the communities as well as local review and feedback.

Population

When compared with the Commonwealth as a whole, the population of the Montachusett region is expected to grow at a lower rate until 2040 (Refer to the following Figure 4 - 32). The change in the Montachusett population is expected to lag from approximately 2.5 to 3.0 percentage points behind the state. By 2040, the expected population growth rate for the region from 2010 is projected at 3.90% while Massachusetts is projected at 12.72%.

When compared to the other 12 RPA's in Massachusetts, Montachusett is 1 of 11 regions anticipated to see positive growth in population over the 2010 to 2040 time period. (See Table 4 - 9). Two of the regions that are expected to see a decline in population over this same period are located west of Montachusett, i.e. Franklin Regional Council of Government (FRCOG) and the Berkshire Regional Planning Commission (BRPC).

Figure 4 - 32. Montachusett vs Massachusetts Population Percent Change



The following tables provide a breakdown of Population, Employment and Household projections by the 13 Regional Planning Areas in the state of Massachusetts. These regional totals were provided to the RPA's by MassDOT and UMDI and represent the control totals for the region in question and the state as a whole. RPA staff then distributed these regional control totals to their member municipalities based on local input, data and knowledge.

Table 4 - 9. RPA Projection Totals for Population, Employment and Households – 2010, 2020, 2030 and 2040

RPA	Census 2010	Population 2020	Population 2030	Population 2040	% Change '10-'20	% Change '10-'40
BRPC	131,219	127,986	128,548	128,063	-2.5%	-2.4%
CCC	215,888	210,930	199,466	176,007	-2.3%	-18.5%
CMRPC	556,698	588,141	619,815	641,260	5.6%	15.2%
FRCOG	71,372	70,804	70,925	69,477	-0.8%	-2.7%
MAPC (97)	3,087,975	3,356,151	3,568,967	3,704,533	8.7%	20.0%
MRPC	236,475	243,607	247,899	245,705	3.0%	3.9%
MVC	16,535	18,156	19,584	19,793	9.8%	19.7%
MVPC	333,748	357,622	370,611	380,912	7.2%	14.1%
NMCOG	286,901	299,617	298,889	295,061	4.4%	2.8%
NPEDC	10,172	11,206	11,804	12,212	10.2%	20.1%
OCPC	362,406	379,936	391,583	396,418	4.8%	9.4%
PVPC	621,570	632,012	647,277	656,992	1.7%	5.7%
SRPEDD	616,670	637,719	650,104	653,966	3.4%	6.0%
MA	6,547,629	6,933,887	7,225,472	7,380,399	5.9%	12.7%

Jobs 2010	Jobs 2020	Jobs 2030	Jobs 2040	% Change '10-'20	% Change '10-'40
60,150	59,772	57,864	57,639	-0.6%	-4.2%
88,596	88,953	81,880	75,299	0.4%	-15.0%
224,059	238,486	240,984	244,265	6.4%	9.0%
25,684	26,055	25,163	24,622	1.4%	-4.1%
1,823,515	1,993,310	2,041,465	2,084,667	9.3%	14.3%
77,199	80,996	79,726	79,098	4.9%	2.5%
7,731	8,256	8,349	8,362	6.8%	8.2%
145,374	158,793	159,763	161,742	9.2%	11.3%
119,332	128,420	127,398	127,359	7.6%	6.7%
5,699	6,227	6,256	6,212	9.3%	9.0%
140,572	149,986	149,870	150,406	6.7%	7.0%
252,156	261,527	260,253	260,838	3.7%	3.4%
229,400	242,461	242,848	243,002	5.7%	5.9%
3,199,467	3,443,242	3,481,819	3,523,509	7.6%	10.1%

RPA	Census 2010	Households 2020	Households 2030	Households 2040	% Change '10-'20	% Change '10-'40
BRPC	56,091	58,453	60,341	60,055	4.2%	7.1%
CCC	95,755	97,410	93,355	82,313	1.7%	-14.0%
CMRPC	210,870	234,781	256,845	270,061	11.3%	28.1%
FRCOG	30,462	32,675	34,478	34,427	7.3%	13.0%
MAPC (97)	1,216,543	1,377,472	1,505,119	1,582,644	13.2%	30.1%
MRPC	89,816	98,864	105,522	107,413	10.1%	19.6%
MVC	7,368	8,368	9,180	9,359	13.6%	27.0%
MVPC	123,577	140,546	152,363	159,348	13.7%	28.9%
NMCOG	104,022	116,271	121,559	122,740	11.8%	18.0%
NPEDC	4,229	4,644	4,787	4,780	9.8%	13.0%
OCPC	129,490	143,521	152,908	156,069	10.8%	20.5%
PVPC	238,629	255,326	270,293	278,094	7.0%	16.5%
SRPEDD	240,223	261,815	277,728	284,421	9.0%	18.4%
MA	2,547,075	2,830,145	3,044,477	3,151,722	11.1%	23.7%

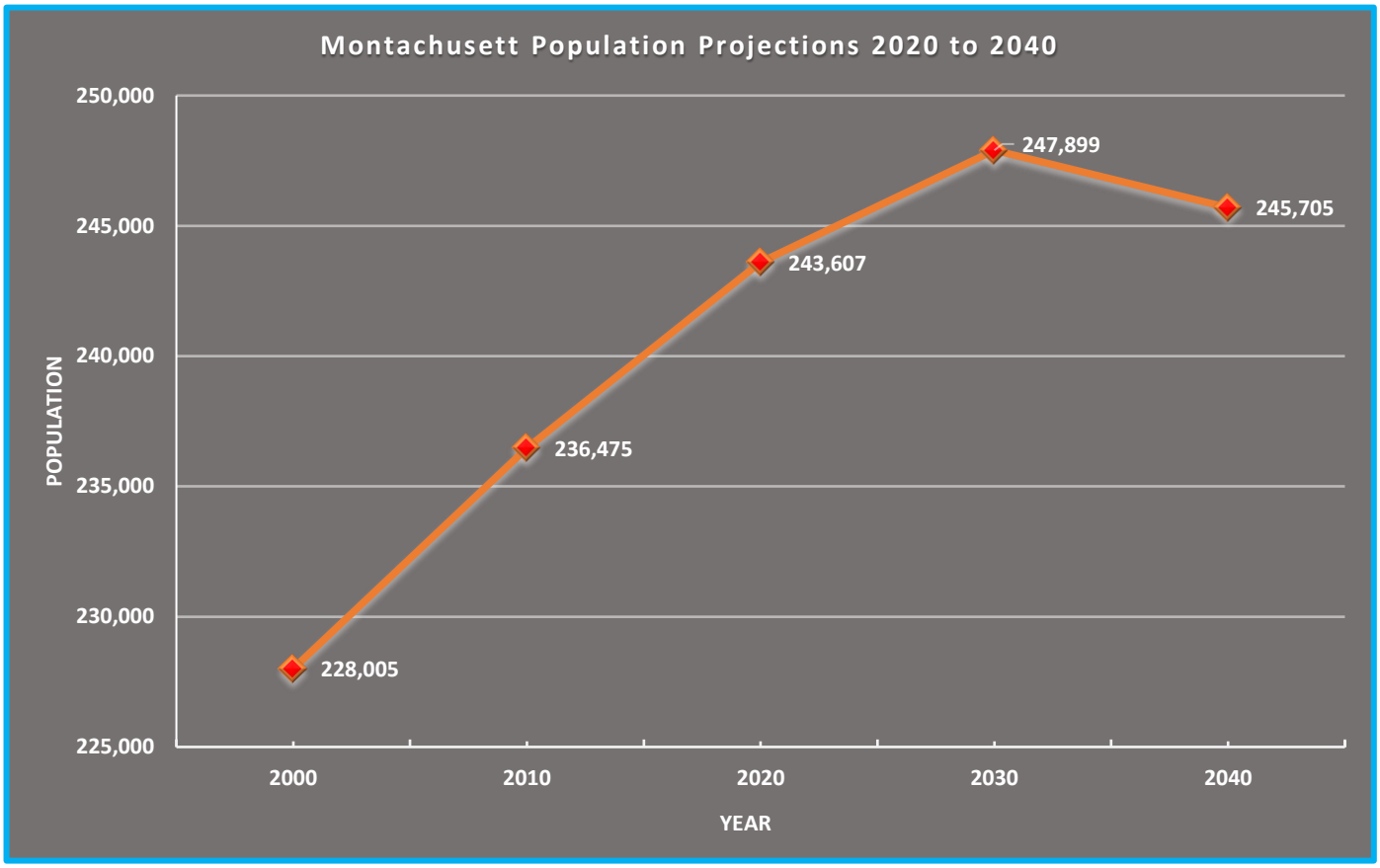
Population growth in the region is expected to peak in 2030 to 247,899 persons but slightly decrease by -0.89% (or -2,194 persons) by 2040.

Within the communities of the Montachusett region, population changes from 2010 to 2040 will vary from an increase of 42% (3,269 persons) in Harvard to a decrease of -11% (-129 persons) in Royalston. Of the three cities of Fitchburg, Gardner, and Leominster, Fitchburg and Gardner are projected to gain population at a 6.67% and 4.81%, respectively. Leominster it is projected to decrease by -1.13% (or 1,003 persons). See Table 4 - 10 for population projections for each Montachusett region community.

Table 4 - 10. Population Projections – Montachusett Region

TOWN	COUNTY	Census 2000	Census 2010	2020	2030	2040	% Change '10-'20	% Change '20-'30	% Change '30-'40	% Change '10-'40
Ashburnham	Worcester	5,546	6,081	6,142	6,250	6,195	1.00%	1.76%	-0.88%	1.87%
Ashby	Middlesex	2,845	3,074	3,111	3,166	3,138	1.20%	1.77%	-0.88%	2.08%
Athol	Worcester	11,299	11,584	12,185	12,399	12,290	5.19%	1.76%	-0.88%	6.09%
Ayer	Middlesex	7,287	7,427	7,578	7,712	7,644	2.03%	1.77%	-0.88%	2.92%
Clinton	Worcester	13,435	13,606	13,848	13,732	13,351	1.78%	-0.84%	-2.77%	-1.87%
Fitchburg	Worcester	39,102	40,318	42,640	43,391	43,007	5.76%	1.76%	-0.88%	6.67%
Gardner	Worcester	20,770	20,228	21,639	22,021	21,200	6.98%	1.77%	-3.73%	4.81%
Groton	Middlesex	9,547	10,646	11,340	12,090	12,773	6.52%	6.61%	5.65%	19.98%
Harvard	Worcester	5,981	6,520	7,439	8,869	9,250	14.10%	19.22%	4.30%	41.87%
Hubbardston	Worcester	3,909	4,382	4,777	5,232	5,497	9.01%	9.52%	5.06%	25.45%
Lancaster	Worcester	7,380	8,055	8,025	8,166	8,094	-0.37%	1.76%	-0.88%	0.48%
Leominster	Worcester	41,303	40,759	40,577	40,046	40,300	-0.45%	-1.31%	0.63%	-1.13%
Lunenburg	Worcester	9,401	10,086	10,275	10,456	10,364	1.87%	1.76%	-0.88%	2.76%
Petersham	Worcester	1,180	1,234	1,270	1,293	1,281	2.92%	1.81%	-0.93%	3.81%
Phillipston	Worcester	1,621	1,682	1,723	1,697	1,628	2.44%	-1.51%	-4.07%	-3.21%
Royalston	Worcester	1,254	1,258	1,223	1,210	1,125	-2.78%	-1.06%	-7.02%	-10.57%
Shirley	Middlesex	6,373	7,211	6,989	7,112	7,049	-3.08%	1.76%	-0.89%	-2.25%
Sterling	Worcester	7,257	7,808	7,817	7,746	7,108	0.12%	-0.91%	-8.24%	-8.97%
Templeton	Worcester	6,799	8,013	7,766	7,903	7,833	-3.08%	1.76%	-0.89%	-2.25%
Townsend	Middlesex	9,198	8,926	8,970	8,606	8,350	0.49%	-4.06%	-2.97%	-6.45%
Westminster	Worcester	6,907	7,277	7,457	7,607	7,420	2.47%	2.01%	-2.46%	1.97%
Winchendon	Worcester	9,611	10,300	10,816	11,195	10,808	5.01%	3.50%	-3.46%	4.93%
REGION		***228,005***	***236,475***	***243,607***	***247,899***	***245,705***	***3.02%***	***1.76%***	***-0.89%***	***3.90%***
Massachusetts		**6,349,097**	**6,547,629**	**6,933,887**	**7,225,472**	**7,380,399**	**5.90%**	**4.21%**	**2.14%**	**12.72%**

Figure 4 - 33. Montachusett Population Projections 2020 to 2040



Households

The number of households in the region is expected to generally follow the same projected growth pattern as projected population growth. However, the number of households does not peak in 2030 as population is expected to do but rather continues to increase slightly by 1.79% (1,891 households) by 2040 (Figure 4 - 34).

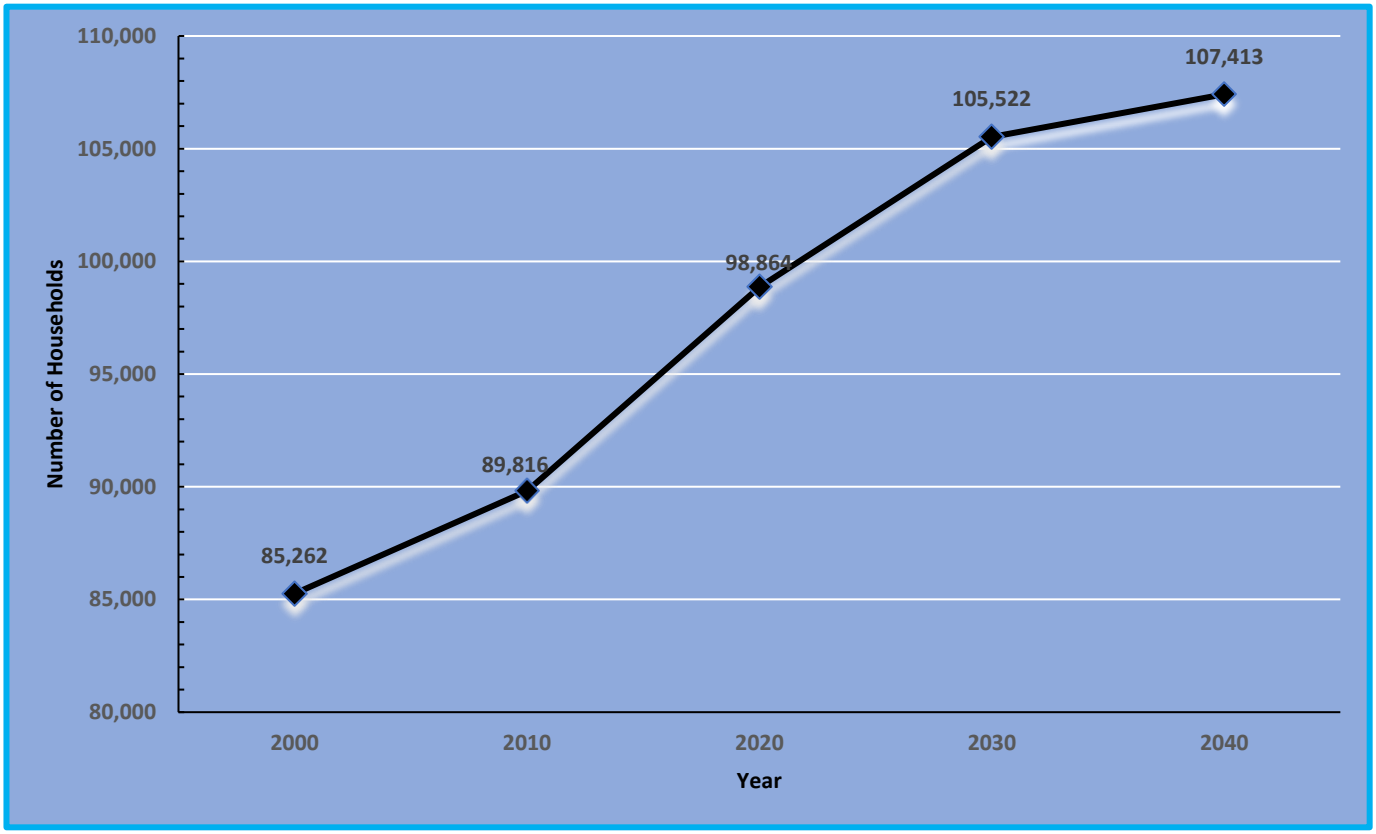
Within the communities of the Montachusett region, household changes from 2010 to 20140 will vary greatly. As with population projected growth, households in Harvard will have the greatest growth at 74.56%, a total increase of 1,411 households. Sterling is projected to see an increase of 5.47% over the 2010-2040 time frame, the smallest in the region. Overall, all 22 communities are expected to see growth in households over the 30-year period. This is a trend seen in the decade numbers from 2010 to 2020 and 2020 to 2030. It is not until 2040 that any community is expected to see a decline in households and then in only six municipalities (Athol (-0.54%),

Clinton (-1.10%), Gardner (-0.92%), Sterling (-6.56%), Templeton (-0.14%) and Westminster (-1.02%). See Table 4-11 for household projections for each Montachusett region community.

Table 4 - 11. Household Projections – Montachusett Region

TOWN	COUNTY	Census 2000	Census 2010	2020	2030	2040	% Change '10-'20	% Change '20-'30	% Change '30-'40	% Change '10-'40
Ashburnham	Worcester	1,929	2,148	2,316	2,432	2,443	7.82%	5.02%	0.45%	13.73%
Ashby	Middlesex	978	1,105	1,184	1,247	1,265	7.14%	5.32%	1.46%	14.48%
Athol	Worcester	4,487	4,656	5,156	5,428	5,399	10.73%	5.28%	-0.54%	15.95%
Ayer	Middlesex	2,982	3,118	3,405	3,715	3,897	9.20%	9.11%	4.91%	24.99%
Clinton	Worcester	5,597	5,831	6,134	6,290	6,221	5.19%	2.55%	-1.10%	6.69%
Fitchburg	Worcester	14,943	15,165	16,850	17,648	17,859	11.11%	4.74%	1.19%	17.76%
Gardner	Worcester	8,282	8,224	9,311	9,933	9,842	13.22%	6.68%	-0.92%	19.67%
Groton	Middlesex	3,268	3,753	4,597	5,333	5,881	22.49%	16.01%	10.27%	56.70%
Harvard	Worcester	1,809	1,893	2,341	2,998	3,304	23.65%	28.09%	10.21%	74.56%
Hubbardston	Worcester	1,308	1,566	1,900	2,252	2,448	21.36%	18.51%	8.71%	56.35%
Lancaster	Worcester	2,049	2,409	2,616	2,821	2,854	8.60%	7.84%	1.16%	18.47%
Leominster	Worcester	16,491	16,767	17,666	18,261	18,843	5.36%	3.37%	3.19%	12.38%
Lunenburg	Worcester	3,535	3,835	4,180	4,480	4,521	8.99%	7.19%	0.90%	17.88%
Petersham	Worcester	438	493	554	602	606	12.33%	8.76%	0.57%	22.86%
Phillipston	Worcester	580	633	725	785	808	14.55%	8.32%	2.85%	27.62%
Royalston	Worcester	449	498	554	601	604	11.26%	8.55%	0.38%	21.23%
Shirley	Middlesex	2,067	2,264	2,433	2,727	2,857	7.47%	12.07%	4.76%	26.17%
Sterling	Worcester	2,573	2,810	3,038	3,172	2,964	8.13%	4.39%	-6.56%	5.47%
Templeton	Worcester	2,411	2,882	2,939	3,087	3,082	1.96%	5.04%	-0.14%	6.95%
Townsend	Middlesex	3,110	3,240	3,659	3,773	3,788	12.92%	3.13%	0.39%	16.92%
Westminster	Worcester	2,529	2,716	2,943	3,139	3,107	8.34%	6.69%	-1.02%	14.41%
Winchendon	Worcester	3,447	3,810	4,365	4,795	4,820	14.57%	9.86%	0.52%	26.52%
REGION		***85,262***	***89,816***	***98,864***	***105,522***	***107,413***	***10.07%***	***6.73%***	***1.79%***	***19.59%***
Massachusetts		**2,443,580**	**2,547,075**	**2,830,145**	**3,044,477**	**3,151,722**	**11.11%**	**7.57%**	**3.52%**	**23.74%**

Figure 4 - 34. Montachusett Household Projections 2020 to 2040



Employment

Employment growth in the region is expected to peak in 2020 to 80,996 persons but slightly decrease -1.57% (-1,269 persons) in 2030 and an additional -0.79% in 2040. This follows an anticipated slowdown in employment statewide as growth in the ten-year periods of 2010 to 2020, 2020 to 2030 and 2030 to 2040 are projected at 7.62%, 1.12% and 1.20%, respectively.

Table 4 - 12. Employment Projections – Montachusett Region

TOWN	COUNTY	DET 2000	DET 2010	2020	2030	2040	% Change '10-'20	% Change '20-'30	% Change '30-'40	% Change '10-'40
Ashburnham	Worcester	1,008	1,006	1,055	1,039	1,031	4.92%	-1.57%	-0.79%	2.46%
Ashby	Middlesex	229	278	292	287	285	4.92%	-1.57%	-0.79%	2.46%
Athol	Worcester	3,708	3,352	3,517	3,462	3,434	4.92%	-1.57%	-0.79%	2.46%
Ayer	Middlesex	6,006	4,821	5,058	4,979	4,940	4.92%	-1.57%	-0.79%	2.46%
Clinton	Worcester	4,886	4,915	5,157	5,076	5,036	4.92%	-1.57%	-0.79%	2.46%
Fitchburg	Worcester	14,738	12,668	13,291	13,083	12,980	4.92%	-1.57%	-0.79%	2.46%
Gardner	Worcester	8,434	8,032	8,427	8,295	8,230	4.92%	-1.57%	-0.79%	2.46%
Groton	Middlesex	2,988	4,371	4,586	4,514	4,479	4.92%	-1.57%	-0.79%	2.46%
Harvard	Worcester	1,041	2,722	2,856	2,811	2,789	4.92%	-1.57%	-0.79%	2.46%
Hubbardston	Worcester	597	477	500	493	489	4.92%	-1.57%	-0.79%	2.46%
Lancaster	Worcester	2,823	1,973	2,070	2,038	2,022	4.92%	-1.57%	-0.79%	2.46%
Leominster	Worcester	18,896	17,514	18,375	18,087	17,945	4.92%	-1.57%	-0.79%	2.46%
Lunenburg	Worcester	2,385	2,211	2,320	2,283	2,265	4.92%	-1.57%	-0.79%	2.46%
Petersham	Worcester	142	124	130	128	127	4.92%	-1.57%	-0.79%	2.46%
Phillipston	Worcester	175	170	178	176	174	4.92%	-1.57%	-0.79%	2.46%
Royalston	Worcester	157	125	131	129	128	4.92%	-1.57%	-0.79%	2.46%
Shirley	Middlesex	2,114	2,271	2,383	2,345	2,327	4.92%	-1.57%	-0.79%	2.46%
Sterling	Worcester	2,061	2,338	2,453	2,415	2,396	4.92%	-1.57%	-0.79%	2.46%
Templeton	Worcester	1,692	1,674	1,756	1,729	1,715	4.92%	-1.57%	-0.79%	2.46%
Townsend	Middlesex	2,249	2,030	2,130	2,096	2,080	4.92%	-1.57%	-0.79%	2.46%
Westminster	Worcester	3,641	2,514	2,638	2,596	2,576	4.92%	-1.57%	-0.79%	2.46%
Winchendon	Worcester	1,843	1,613	1,692	1,666	1,653	4.92%	-1.57%	-0.79%	2.46%
REGION		***81,813***	***77,199***	***80,996***	***79,726***	***79,098***	***4.92%***	***-1.57%***	***-0.79%***	***2.46%***
Massachusetts		**3,227,286**	**3,199,467**	**3,443,242**	**3,481,819**	**3,523,509**	**7.62%**	**1.12%**	**1.20%**	**10.13%**

Figure 4 - 35. Montachusett Employment Projections 2020 to 2040

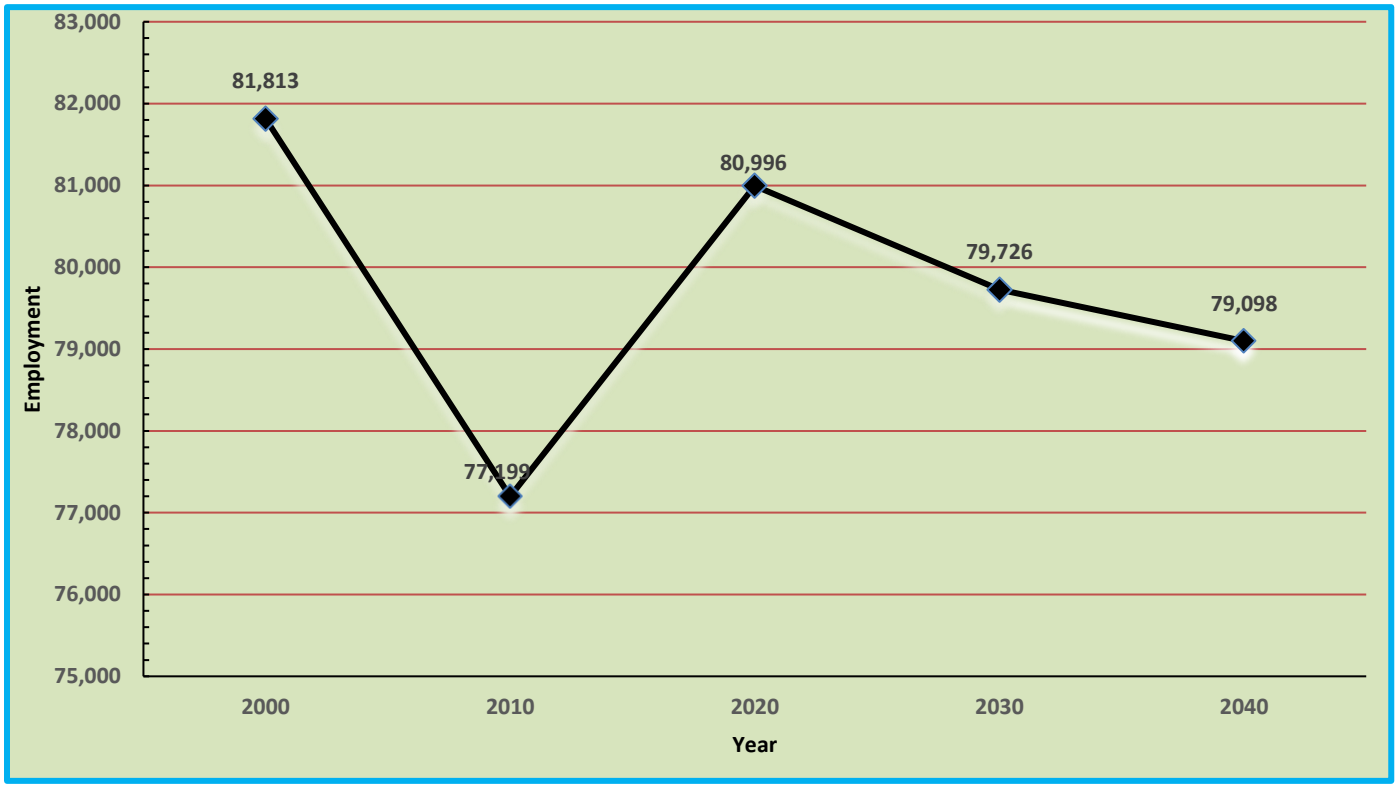
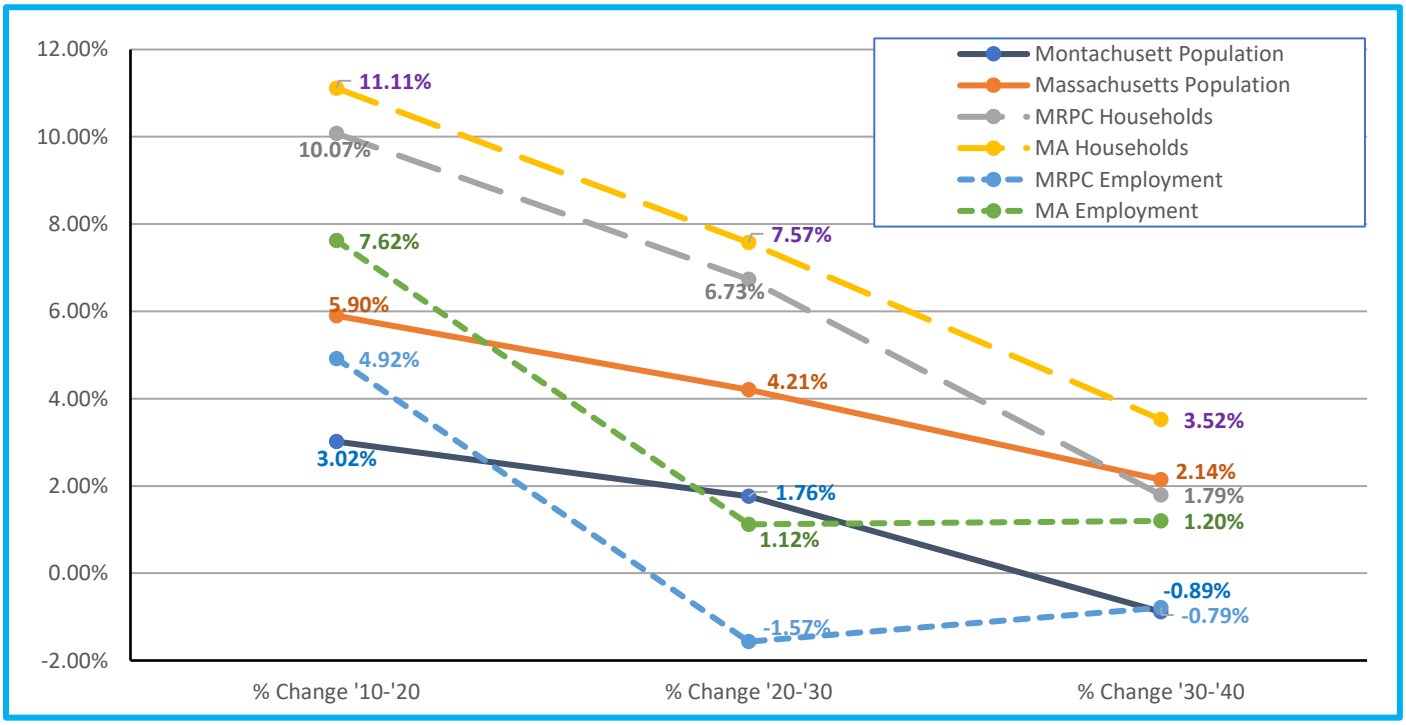


Figure 4 - 36. Montachusett vs Massachusetts - Percent Change Comparison



Trends

Through the development and analysis of the demographics and projections for the Montachusett region, the following trends were identified and noted. Following these trends, a series of recommendations are presented for the region.

- Current growth expected to continue but future projections anticipate a slowdown and gradual decline.
- The population in the region is aging faster than in the state or nation. This trend is also reflected in the 2020, 2030 and 2040 projections where the overall growth in the population of the region is expected to slow and decline. This aging of a large proportion of the population poses a number of planning challenges for the Region, including accessibility to health care and elderly services, public transportation, senior housing. In addition, there will be generational shifts in employment sectors and the workforce.
- Educational attainment rates are increasing in the regions male and female populations. However, they still remain lower than state averages. Efforts are needed in the Region to retain this increasing educated population and subsequently help to address shifts in the employment sectors.
- Ten Montachusett communities have a higher proportion of residents with a disability than the state as a whole. Athol, Phillipston, and Fitchburg top the list. Among other planning considerations, the high percentages of residents with disabilities, coupled with a steadily aging population, only help to emphasize the importance of multimodal and functional transportation network.
- Fifteen (15) of the region's 22 communities have a lower per capita income than the state ($39,913), while nine rank below the state when examining median household income.
- An estimated 11% of individuals are living in poverty within the Commonwealth of Massachusetts. Six Montachusett communities have a higher concentration of poverty than the state as a whole, with Fitchburg (17.9%), Gardner (16.7%), and Athol (14.7%) also exceeding the national poverty rate of 14.6%. Between 2016 and 2017, poverty rates declined in the region at a quicker pace than both the state and nation. In order to reverse these trends, additional opportunities to create a more diverse employment sector is

needed. Along with this, is the need for improved access to these jobs at a reasonable cost for those in the lower income strata.

- Based on an analysis of current and past transportation and highway projects versus identified Environmental Justice and Title VI populations, there does not appear to be an undo benefit or burden on these populations.
- Housing in the region trends toward single family homes. This along with a rising median home values can affectively price individuals out of the Montachusett Region. This can be especially harmful to younger, more highly educated individuals, which in turn can exasperate the aging population situation. In order to serve the regions changing population characteristics, i.e. aging, diversified, and low income, affordable housing units (either as single or multiple units) need to be an emphasis for the region's officials. Additionally, where appropriate direct tie ins to available transportation options should be a major factor for local officials in this area.
- Manufacturing continues to remain the largest employment sector in the region (17% of total employees) and integral to the economic health of many communities. The level of manufacturing-based employment, despite the decline in recent decades, continues to out strip that of both the state and country. While efforts continue toward diversifying the regional economy into other growing sectors, including the service sectors, the region's comparative advantage of an experienced manufacturing workforce and industrial space will help keep manufacturing as a cornerstone in the region's economy.
- Montachusett Region commuters are more auto-reliant than in the state or the nation. Ninety percent (90%) of workers either drive alone or carpool to work as compared to 78% of workers in Massachusetts, and 85% of workers in the country. Montachusett residents are also significantly less reliant upon public transit. The longer commute times and distances of Montachusett individuals tend to put more emphasis on the traditional commuter roads in the region, i.e. Route 2, I-190, Route 117, Route 119, Route 140, Route 12, etc. The potential for increased public transit usage exists if expansion and costs can be implemented in a reasonable fashion. In addition, these segments of commuters are also likely to be impacted by technological changes in travel modes, i.e. autonomous

vehicles, rideshare options and alternative energy vehicles. With a greater demand or usage of these technologies, critical support infrastructure is needed from long term parking areas for autonomous vehicles, to charging stations, to incentive programs.

Recommendations

The following is a series of recommendations based upon the identified trends related to the demographic profile of the Montachusett Region. It should not be viewed as a complete and finite list but rather a starting point for the continued review of the needs of the region.

1. The aging of the region's population requires that several issues be addressed:
    a. Expanded transit options to vital services for elderly. Expansion to needed services such as medical and shopping should remain a priority. Additionally, connections between communities should be examined and implemented where feasible.
    b. Upgrades, expansion and improvements to the pedestrian network in the core centers of communities and in and around identified service areas, i.e. medical facilities, shopping centers, etc. Safer sidewalks and pedestrian corridors will also serve other segments of the population beyond the elderly.
    c. Safety improvements along the road and pedestrian/bicycle networks need to be expanded and prioritized to help deal with the aging population as well as assisting with other segments with their activities.
2. Identification and prioritization are needed for projects that assist the disabled community throughout the region. This would include better sidewalks, improved access to transit options, and eliminating gaps in the network that prevent or discourage usage (ex. incomplete or non-existing sidewalks on fixed route transit lines).
3. Expansion of employment opportunities are needed in order to retain and expand the regional workforce. As the educational level continues to rise in the region, without adequate employment options, the population will continue to age as younger individuals seek better paying jobs outside of the region. Network improvements are needed to

assist and encourage employers to remain in the region. This would involve infrastructure improvements to support industries, multiple travel options to bring employees to and from work, and expansion of outreach efforts to all segments of the population. Continued emphasis on maintaining pavement conditions and reducing bridge deficiencies will allow for greater marketing by municipalities of available industrial and commercial areas.

4. Expansion of mode options for commuters needs to also be a priority for the region. This would also involve the region's trail/pedestrian/bicycle networks. These systems can be improved and expanded in order to provide additional walking and biking mode options.
5. Additional planning is needed to address future technological advances in transportation as they occur and become more and more feasible. This would include issues such as:
    a. Autonomous vehicles. Where will they "park" when riders have reached their destinations? Is there a need for special lots or facilities? Are there potential congestion issues at the start and end of work shifts? Will "peak hours" increase because the autonomous vehicle may be making additional trips to desired locations (i.e. one trip in and one trip out in both the AM and PM (4 trips) as opposed to a driver that has one trip in and one trip out in the AM and PM (2 trips))?
    b. Alternative energy vehicles. Where should charging stations be located? How many facilities exist and do they adequately serve the population now? Environmentally, are there any drawbacks associated with batteries, etc., that need to be addressed?
    c. Ride share options. Can these systems be expanded to address the needs of the elderly, low income and disabled populations? Can the systems expand to the more rural communities to serve these areas without viable transit options?
6. The population is getting more and more diverse in terms of minority populations and language. Additional efforts are needed to draw these individuals into the transportation planning process to ensure adequate representation and service.

INFRASTRUCTURE

Within the transportation system, the infrastructure that makes up and serves the roadway network is critical to its effectiveness and efficiency. Poorly maintained bridges, and pavement impact all aspects of movement, from commuting and recreation to freight and emergency services.

Bridges

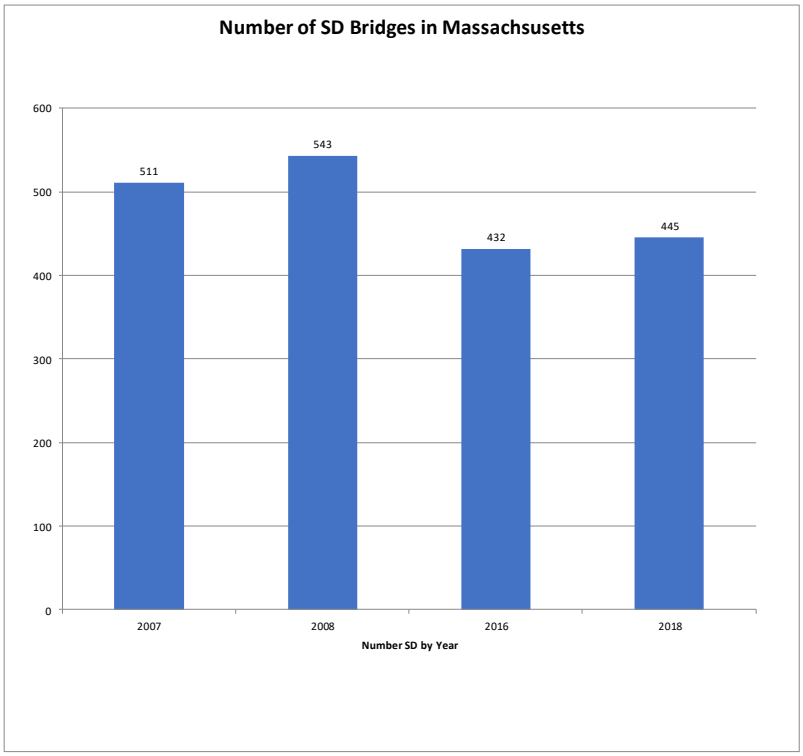
Throughout the Montachusett region, many of its roads travel over numerous brooks, rivers and water bodies. Within the 22 communities of the Montachusett planning area, some 326 bridges are identified and rated by MassDOT as part of their inventory system. MassDOT regularly provides MRPC access to its bridge inventory which includes data such as the community where the bridge is located, the road name that the bridge is located on, the bridge identification number, functional classification of the road, year built, historical significance, rebuilt date (if applicable), AASHTO (American Association of State Highway and Transportation Officials) rating, and the deficiency status of each bridge, i.e. structurally deficient.

Structurally deficient bridges are a main concern in terms of repair priorities. A Structurally deficient bridge is not necessarily unsafe but is deteriorated to a point where it must be closely monitored and inspected or repaired. Structurally deficient bridges can result in bridge closings and weight restrictions which alter traffic patterns by forcing vehicles to find alternate routes frequently leading through residential streets. The result is increased congestion and pollution, potential loss of business, the potential for more accidents and failure of the emergency response times and planning process.

Accelerated Bridge Program

The Accelerated Bridge Program (ABP) was initiated by the MassDOT in 2008 as an effort to reduce the number of bridges rated as structurally deficient. On February 1, 2007, there were 511 structurally deficient (SD) bridges statewide. This number increased to 543 by July 1, 2008 when the ABP Program was initiated. Without the program, the number of SD bridges was expected to rise to 697 by October 1, 2016. The goal of the program was to reduce the number of SD bridges to fewer than 450 by October 1, 2016. That goal was reached with 432 ABP-eligible structurally deficient bridges as of October 1, 2016. The number of ABP-eligible structurally deficient bridges as of September 1, 2018 was 445.

Figure 4-37: Number of Structurally Deficient Bridges in Massachusetts



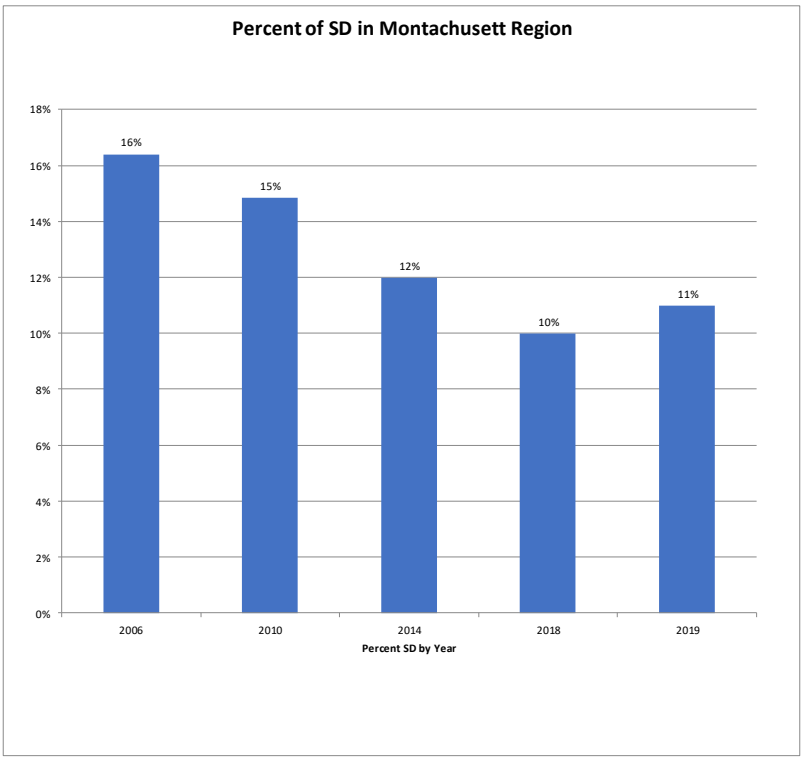
Montachusett Bridges – Current & Historical

The following table and graph provide a breakdown of the total bridge numbers regionwide as well as the number of SD bridges in each community from bridge inventories over the years.

Table 4-13: Structurally Deficient Bridge Changes

MRPC Region	Year	Total	SD	% of Total
	2019	326	35	10.7%
	2018	324	32	9.9%
	2014	321	38	11.8%
	2010	317	47	14.8%
	2006	317	52	16.4%
	13 Year Change	**9**	**-17**	**-5.7%**

Figure 4-39: Percent of Structurally Deficient Bridges in Region



Within the Montachusett Region, the 2019 bridge inventory lists 35 bridges as SD. This represents approximately 11% (35 of 326) of the Region's total bridges. Of particular note is that bridge inventories from 2006 and 2010 report structurally deficient bridges being around 15% of the total in the region. A major reason for the decrease in both number and percentage of SD bridges throughout the region in the following decade is due to major investments made from the Accelerated Bridge Funding Program. As this funding program has ended, recent inventories

show a plateau trend in which the number and percentage of bridges rated as SD are leveling off, or even increasing.

In order to maintain an efficient movement of goods and people, a responsive and adequately funded bridge maintenance program is essential. It is important to discourage the previous trend of increasing percentage of bridges being rated as structurally deficient. These percentages will be monitored in future inventories to determine where current trends are heading.

Pavement

The *Pavement Management Program* at MRPC consists of surveying all federal aid eligible roadways in the region for the purpose of collecting, maintaining and evaluating pavement condition data for use in transportation plan and project decision making.

There are approximately 666 miles of federal aid eligible roads in the Montachusett region, of which 159 miles are National Highway System (NHS) roads, and 507 miles are Surface Transportation Block Grant (STBG) roads. NHS roadways represent all Interstate roadways such as I-190, and I-495 along with a systematic network of principal arterials such as Route 2 and parts of Routes 12, 140 and 2A; NHS roads are regularly surveyed by MassDOT. STBG roadways, which include all other numbered routes as well as all urban arterials, urban collectors and rural arterials, are surveyed mostly by the MRPC, MassDOT also regularly collects data on all numbered routes.

The Roadway System

Of the approximately 2,094 miles of roads in the Montachusett region, approximately 507 miles are Surface Transportation Block Grant (STBG) eligible roadways and 159 miles are National Highway System (NHS) eligible roadways. This represents 31% of the region's road miles. The remaining 1,425 miles (69%) are state and local aid eligible roads.

They are defined as follows:

National Highway System (NHS) – all interstate roadways and a systematic network of principal arterials spanning the state. In addition, roads connecting the NHS roadways to military bases (known as the Strategic Highway Network) are also considered part of the NHS network. NHS passenger and freight terminals are connected by roadways called NHS connectors.

Surface Transportation Block Grant (STBG) – comprised of any functionally classified roadway not part of the NHS network. STBG funded roadways include all urban arterials, urban collectors and rural arterials. According to previous funding legislation, rural collectors are STBG eligible, but have a limitation on the STBG funding amount.

State and Local Aid – includes Chapter 90 and other non-Federal Aid categories. Roadways that fall under this category are comprised of roads functionally classified as local roads.

The following table provides a breakdown of roads by community by their aid eligibility, NHS, STBG or State Aid/Local.

Table 4-14: Regional Centerline Miles

CENTERLINE MILES	NHS	STP	Total Fed-Aid	Local	Total
Ashburnham	0.00	20.33	20.33	77.27	97.61
Ashby	0.00	14.21	14.21	49.89	64.09
Athol	11.53	20.86	32.39	80.69	113.08
Ayer	7.25	9.73	16.98	34.27	51.25
Clinton	4.97	12.58	17.54	35.53	53.07
Fitchburg	18.35	47.36	65.72	136.48	202.20
Gardner	10.98	30.69	41.66	75.19	116.86
Groton	13.11	20.88	33.99	74.46	108.44
Harvard	8.84	10.17	19.01	60.48	79.50
Hubbardston	0.00	21.30	21.30	64.47	85.78
Lancaster	12.10	19.30	31.40	39.92	71.32
Leominster	19.18	42.62	61.80	116.99	178.79
Lunenburg	8.81	25.04	33.85	57.72	91.57
Petersham	0.00	19.61	19.61	59.61	79.21
Phillipston	2.97	8.23	11.20	41.31	52.51
Royalston	0.00	20.99	20.99	51.49	72.49
Shirley	1.05	18.89	19.94	31.72	51.66
Sterling	12.03	31.53	43.56	62.56	106.21
Templeton	5.68	35.09	40.78	58.91	99.69
Townsend	4.05	21.64	25.68	67.78	93.46
Westminster	9.28	33.98	43.26	65.29	108.55
Winchendon	8.92	22.86	31.78	85.01	116.80
TOTAL	159.10	507.89	666.98	1427.04	2094.14

Regional Pavement Conditions

The structural conditions of the majority of the Federal Aid eligible roads are determined by MassDOT and MRPC pavement surveys. The condition is determined through pavement surveys and expressed by assigning a Pavement Serviceability Index (PSI) number. PSI is an overall rating of the pavements condition. Conditions are rated as Excellent, Good, Fair and Poor. The following table shows a general correlation between PSI, condition and repair strategies.

Table 4-15: Condition with Associated Repair

PSI	Condition	Associated Repair
0 - 2.29	Poor	Reconstruction
2.3 - 2.79	Fair	Rehabilitation (Mill/Overlay)
2.8 - 3.49	Good	Preventative Maintenance
3.5 - 5	Excellent	Routine Maintenance

Utilizing this information, a general condition of the Montachusett Region's federal aid eligible roadway network can be developed. The following table lists pavement condition on federal aid eligible roads regionwide. These federal aid miles are further broken down by local and state jurisdiction. Please note that due to the time frame between data collection and report preparation, conditions of the roadways may change. Additionally, mileage listed in the following charts may not reflect mileage listed on the "Total Fed-Aid Miles" column of the Centerline Miles table as a small percentage of roads may not have been surveyed and are not reflected in the data. Therefore, this information should be viewed in general terms regarding needs and condition.

Table 4-16: 2019 Regionwide Conditions

Regionwide 2019		State	Local	Combined	
		Miles	Miles	Repair Category	Miles
	Excellent	57.21	102.06	Routine Maintenance	159.27
	Good	67.07	87.06	Preventative Maintenance	154.13
	Fair	38.91	117.21	Rehabilitation	156.13
	Poor	22.83	167.07	Reconstruction	189.90
	Total	186.03	473.40	Total	659.43

In comparing current regionwide network conditions to those from 2015, it would appear that the overall condition of federal aid eligible roads to show similarities over the course of four years. The major difference in the combined condition percentage is the increase of roads rated as "Poor" by six percentage points of the total. These percentage comparisons, when taken in context, can be assumed to indicate a slight deterioration of road conditions over the four years from 2015 to 2019. It is important to note that this comparison takes into account the generalized categories of "Excellent, Good, Fair, and Poor" only. Due to a changeover in survey format which

occurred in 2016, it is not possible to compare overall PSI numbers from each year. An overall network PSI comparison will be included in future reports when the network is resurveyed and a more precise comparison of data can be demonstrated.

Table 4-17: 2019 and 2015 Regionwide Percentage Comparisons

		State		Local		Combined		
		Miles	%	Miles	%	Repair Category	Miles	%
2019	Excellent	57.21	31%	102.06	22%	Routine Maintenance	159.27	24%
	Good	67.07	36%	87.06	18%	Preventative Maintenance	154.13	23%
	Fair	38.91	21%	117.21	25%	Rehabilitation	156.13	24%
	Poor	22.83	12%	167.07	35%	Reconstruction	189.90	29%
	Total	186.03		473.40		Total	659.43	

		State		Local		Combined		
		Miles	%	Miles	%	Repair Category	Miles	%
2015	Excellent	111.57	47%	56.65	13%	Routine Maintenance	168.22	25%
	Good	62.70	26%	92.37	21%	Preventative Maintenance	155.07	23%
	Fair	33.98	14%	171.13	39%	Rehabilitation	205.11	30%
	Poor	30.22	13%	121.70	28%	Reconstruction	151.92	22%
	Total	238.47		441.85		Total	680.32	

Table 4-18: 2019 Condition Percentage Change

		State		Local		Combined	
		%	% Points Change	%	% Points Change	%	% Points Change
2019	Excellent	31%	-16%	22%	9%	24%	-1%
	Good	36%	10%	18%	-3%	23%	1%
	Fair	21%	7%	25%	-14%	24%	-6%
	Poor	12%	0%	35%	8%	29%	6%

As with the condition of bridges, the regionwide pavement conditions are in danger of deteriorating. It is important to continue to monitor these conditions and consider trends in the decision-making process.

Trends

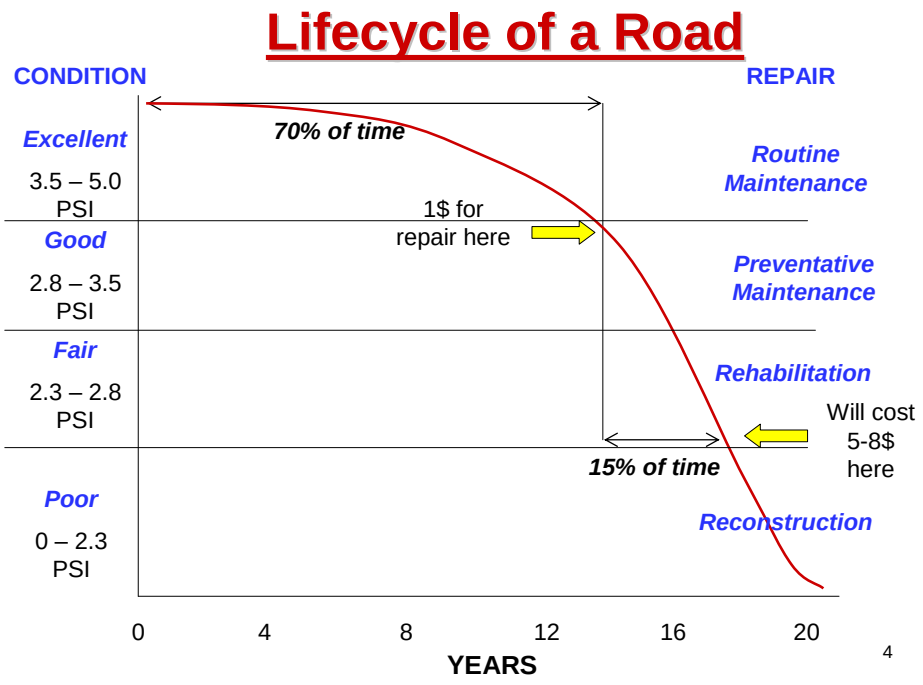
Analysis of roads and bridges in the Montachusett region demonstrate a network that is relatively stable, however, in danger of deterioration if proper investments are not maintained. It is important to prioritize maintenance and repair of these existing infrastructures to be able to maximize public funds and allow additional investments for improvements and expansion.

Recommendations

The transportation system in the Montachusett region largely consists of roads and bridges. Maintaining these assets are a challenge, however, we must understand the importance of a properly functioning and safe system. Maintaining a state of good repair should be a main priority and in our best interest in order to stretch our investments to the greatest benefits. Ultimately, it is recommended that investments are guided by proven asset management practices and the proper amount of investment is made to assure these assets do not deteriorate.

The figure below displays the concept of pavement lifecycle cost. A pavements lifecycle is the time between reconstruction periods. Lifecycle cost is the total cost spent on maintenance and repairs for a particular pavement section during its lifecycle. One of the main focuses of pavement management is to keep lifecycle cost low to stretch the dollar in what is commonly an ever-decreasing maintenance budget.

Figure 4-40: Lifecycle of a Road



Due to the rising cost of improvements and the declining funds for preserving existing infrastructure it is challenging to make improvements to the pavement network. Building a historical and measurable database of conditions in the Montachusett region allows for a snapshot of overall conditions which will allow us to determine how the network changes over time. Maintaining historical databases of bridge and pavement data paired with applying proven methods of asset management is recommended.

Network conditions over the last four years show an increase in percentage of roads in “poor” condition and decrease in percentage of “excellent” condition. This indicates that the current funding level of road maintenance projects is inadequate to keep up with the rate of deterioration. An overall increase in pavement repair projects along with investing in roads before they require full depth reconstruction is recommended. Furthermore, conditions should be closely monitored due to the threat of a deteriorating network.

SAFETY

The MRPC is committed to the goal of improving roadway safety in the Montachusett Region. The MRPC has, and will continue to, work with MassDOT and Member Communities to improve roadway safety. The two focus areas below are the approaches to improving safety in the Montachusett Region.

Massachusetts 2018 Strategic Highway Safety Plan Update (SHSP) Focus:

The MRPC is working cooperatively and in coordination with MassDOT to implement the SHSP. The focus area that follows is modelled after the SHSP. See the Appendix for a summary of the SHSP which includes 14 identified Emphasis Areas.

Reducing the number of Fatalities and Incapacitating Injuries is the top priority in the Montachusett Region based on the following:

- In the 2012 – 2016 five-year period, 541 people received an Incapacitating Injury on Montachusett Region roadways for the 2012 – 2016 five-year period, 73 people lost their lives on Montachusett Region roadways for an annual average of 15 Fatalities. Based on the **Safety Needs - *Total Fatalities in Member Communities*** analysis below, Fatalities have maintained a level annual average of 15 Fatalities which is one above the 2008 – 2012 five-year period annual average of 14 Fatalities.
- an annual average of 108 Incapacitating Injuries. Based on the **Safety Needs - *Total Incapacitating Injuries in Member Communities*** analysis below, Incapacitating Injuries saw an annual average reduction of -13.6% since the 2008 – 2012 five-year period. The annual average for Incapacitating Injuries dropped from 125 to 108 (-17 Incapacitating Injuries).
- In the 2012 – 2016 five-year period, 67 non-motorized people received either a Fatality or an Incapacitating Injury on Montachusett Region roadways for an annual average of 13

Non-Motorized Fatalities and Incapacitating Injuries. Based on the **Safety Needs - *Total Combined Non-Motorized Fatalities and Incapacitating Injuries*** analysis below, Non-Motorized Fatalities and Incapacitating Injuries have maintained an annual average of one to two Non-Motorized Fatalities and Incapacitating Injuries above the 2008 – 2012 five-year period annual average of 12 Non-Motorized Fatalities and Incapacitating Injuries.

Below are two links to the SHSP:

2018 SHSP (for low resolution), **2018 SHSP** (for download and/or print)

Montachusett Region All Mode High Crash Locations (HCLs) Focus and Total Crashes Focus:

Reducing the HCLs needs to continue and the Total Crashes needs to be addressed:

- Based on the **Safety Needs - *HCLs in Member Communities and Region Total Crashes*** analysis below, safety improvement projects have improved safety at former HCLs but reducing the severity and number of crashes at existing and new HCLs needs to occur.
- Between 2012 and 2016, 25,895 crashes occurred on the Region roadways. Based on the **Safety Needs - *HCLs in Member Communities and Region Total Crashes*** analysis below, total crashes have seen an annual average increase of 655 Total Crashes (15.6%) above the 2008 – 2012 five-year period.

Safety Needs

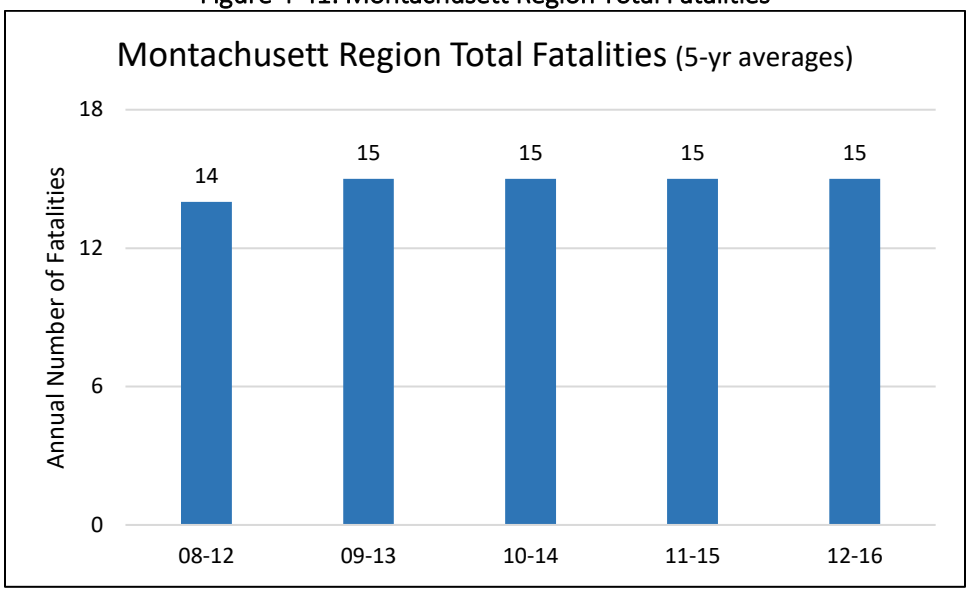
Total Fatalities

Figure 4-41 below, *Montachusett Region Total Fatalities (5-yr averages),* graphically represents the number of roadway crash Fatalities that occurred in the region from 2008 – 2016. The number of Fatalities is provided as an annual average based on a five-year rolling average (i.e. years 08-12, 09-13, etc.).

- **Figure 4-41** shows that the annual average number of Fatalities that have occurred remained consistent over the years from 2008 – 2016. Only the 2008 – 2012 five-year period annual average number of Fatalities varied from the 15 Fatalities per year at 14 Fatalities per year.

- On average, Montachusett Region Fatalities represent 4% of the State's total Fatalities.
- To begin to bring down the average number of Fatalities from 15, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas at the locations where Fatalities are occurring in Member Communities.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact the MRPC for the historic locations of Fatalities within their community.
- MRPC will contact Member Communities concerning the historic locations of Fatalities for further study and potential project development.
- Fatality data is updated by MassDOT which will increase or decrease the five-year rolling average. Refer to **Chapter 3: Performance Measures** for further description of **Figure 4-41**.

Figure 4-41: Montachusett Region Total Fatalities



Fatalities Data Source: MassDOT

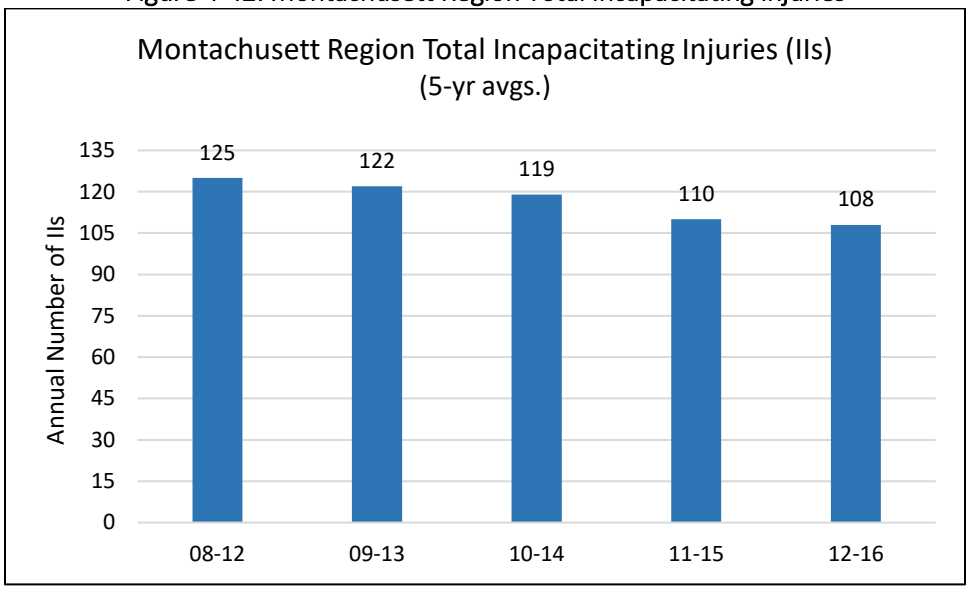
Total Incapacitating Injuries in Member Communities

The figure *Montachusett Region Total Incapacitating Injuries (5-yr avgs.)* (**Figure 4-42**) below graphically represents the number of roadway crash Incapacitating Injuries that occurred in Member Communities from 2008 – 2016. The number of Incapacitating Injuries is provided as an annual average based on a five-year rolling average.

- **Figure 4-42** shows that the annual average number of Incapacitating Injuries that have occurred saw significant reduction since the 2008 – 2012 five-year period (-13.6%, a decrease from 125 to 108 (-17) Incapacitating Injuries.
- On average, Montachusett Region Incapacitating Injuries represent 3.5% of the State's total Incapacitating Injuries.
- To continue to bring down the average number of Incapacitating Injuries from 108, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas at the locations where the Incapacitating Injuries are 4occurring in Member Communities.

- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact MRPC for the historic locations of Incapacitating Injuries within their community.
- MRPC will contact Member Communities concerning the historic locations of Incapacitating Injuries for further study and potential project development.
- Incapacitating Injury data is updated by MassDOT which will increase or decrease the five-year rolling average. Refer to **Chapter 3: Performance Measures** for further description of **Figure 4-42**.

Figure 4-42: Montachusett Region Total Incapacitating Injuries



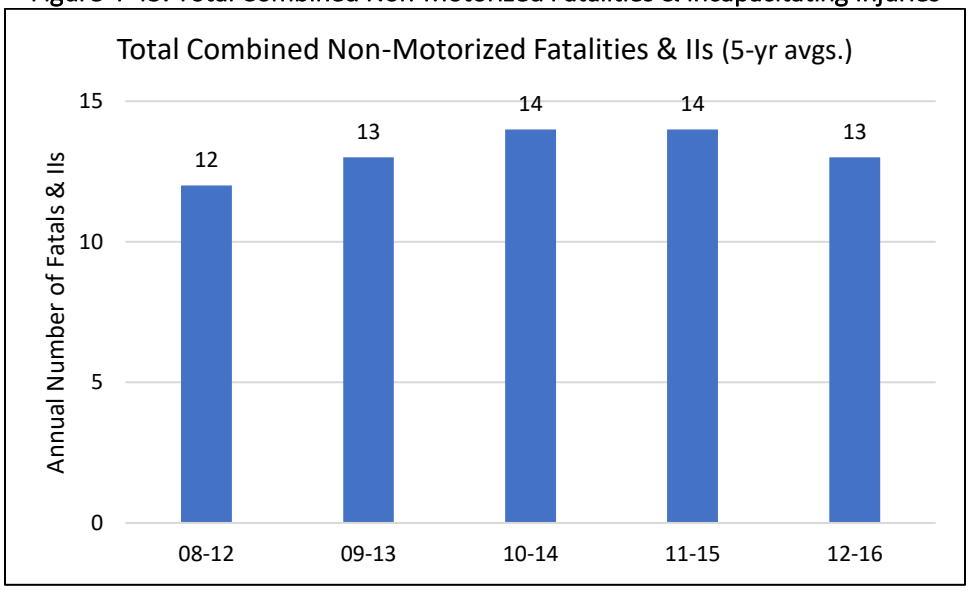
Incapacitating Injuries Data Source: MassDOT

Total Combined Non-Motorized Fatalities and Incapacitating Injuries in MMPO Member Communities

The Montachusett Region figure *Total Combined Non-Motorized Fatalities and Incapacitating Injuries (5-yr avgs.)* (**Figure 4-43**) below graphically represents the number of Non-Motorized Fatalities and Incapacitating Injuries crashes that occurred in the region from 2008 – 2016. The number of Non-Motorized Fatalities and Incapacitating Injuries is provided as an annual average based on a five-year rolling average.

- **Figure 4-43** shows that the annual average number of Non-Motorized Fatalities and Incapacitating Injuries that have occurred ranged from 12 to 14 over the years from 2008 – 2016. The data shows that an upward trend of one to two Non-Motorized Fatalities and Incapacitating Injuries has occurred since 2008 – 2012 five-year period.
- On average, Montachusett Region Non-Motorized Fatalities and Incapacitating Injuries represent 2.6% of the State's total combined Non-Motorized Fatalities and Incapacitating Injuries.
- To begin to bring down the average number of Non-Motorized Fatalities and Incapacitating Injuries from 13, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas at the locations where Non-Motorized Fatalities and Incapacitating Injuries are occurring throughout the region.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact MRPC for the historic locations of Non-Motorized Fatalities and Incapacitating Injuries within their community.
- MRPC will contact Member Communities concerning the historic locations of Non-Motorized Fatalities and Incapacitating Injuries for further study and potential project development
- Non-Motorized Fatalities and Incapacitating Injury data is updated by MassDOT which will increase or decrease the five-year rolling average. Refer to **Chapter 3: Performance Measures** for further description of **Figure 4-43**.

Figure 4-43: Total Combined Non-Motorized Fatalities & Incapacitating Injuries



Fatals & IIs Data Source: MassDOT

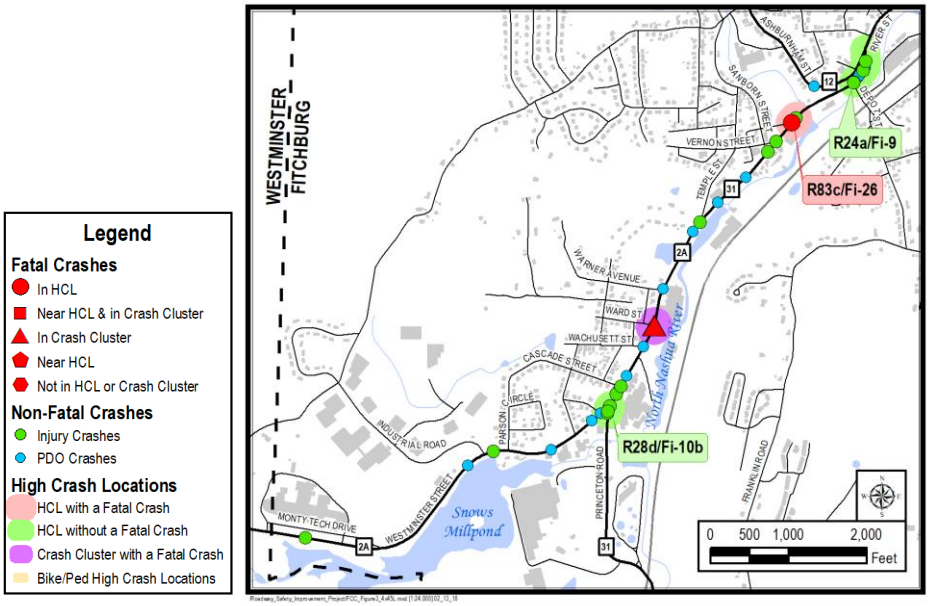
Prioritizing Future Safety Improvement Projects at Fatality Locations

- This prioritization takes into consideration a Fatality's relationship to other crashes.
- A roadway is designated as a Fatal Crash Corridor (FCC) after a Fatality occurs on the segment.
    - The MMPO FCC Table currently contains 42 FCCs
- **Table 4-20** below shows the five FCCs where two or more Fatalities occurred in the region from 2012 – 2014 in the context of their relationship with the number of Injury and Property Damage Only (PDO) crashes that occurred within a one-mile radius of each Fatality.
- **Figure 4-44** below shows the **Route 2A/31, Westminster St** FCC in Fitchburg where three Fatalities occurred.
- Member Communities may choose to contact the MRPC for the FCCs within their community.
- MRPC will contact Member Communities concerning the FCCs for further study and potential project development.
- Fatality data, as with all crash data, is updated by MassDOT.

Table 4-20: Fatal Crash Corridors with Two or More Fatalities

COMMUNITIES	FATAL CRASH CORRIDORS	Fatal	Injury	PDO	Total Corridor Crashes
Ayer	Route 2A & Washington Street	2	18	57	*77*
Fitchburg	Route 2A/31, Westminster St (Fig 4 below)	3	20	70	*93*
Fitchburg & Ashby	Route 31, Fitchburg/Ashby	3	19	92	*114*
Lunenburg & Leominster	Route 13, Electric Ave / Main Street	2	35	121	*158*
Westminster	Route 2A, State Road West	2	4	6	*12*
	TOTAL CRASHES				*454*
	Total Crashes by Severity	*12*	*96*	*346*	
	Percentage of Total Crashes by Severity	*2.6%*	*21.1%*	*76.2%*	

Figure 4-44: Route 2A/31, Westminster St, Fitchburg FCC

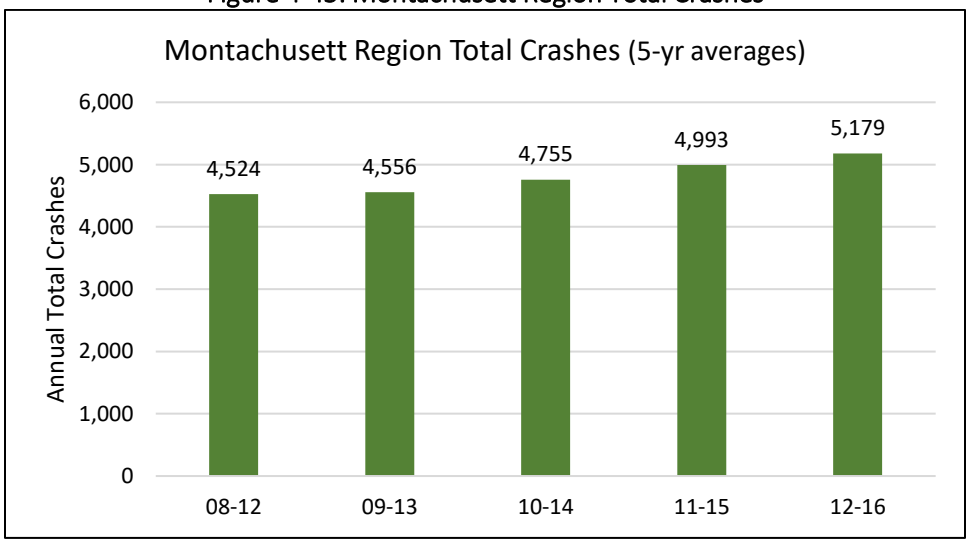


Montachusett Region Total Crashes

The figure *Montachusett Region Total Crash Totals (5-yr averages)* (**Figure 4-45**) below graphically represents the number of total crashes that occurred on the roadways in Member Communities from 2008 – 2016. The number of crashes is provided as an annual average based on a five-year rolling average.

- **Figure 4-45** shows that the annual average number of Total Crashes that have occurred in the Montachusett Region ranged from 4,524 in 2008 – 2012 five-year period to 5,179 in 2012 – 2016 five-year period which is an annual average increase of 655 in Total Crashes (+14.5%).
- To reduce Total Crashes, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas on corridors and at specific locations in Member Communities.
- Total Crash data is updated by MassDOT which will increase or decrease the five-year rolling average.

Figure 4-45: Montachusett Region Total Crashes



Total Crashes Data Source: MassDOT

HCLs in Montachusett Member Communities

As of April, 2019, MassDOT 2016 HCL information is not available. The most current available MassDOT HCL information is for 2015. The analysis below is based on the 2015 HCL information.

There is a very good reason to continue seeking safety improvement projects at HCLs. There has been significant safety improvement at several former HCLs after projects have been completed. Two of the most notable are no longer listed in the most current MMPO Region HCL Table:

- Central Street (Route 12) at Willard Street intersection, Leominster
- Lunenburg Road (Route 70) at Old Union Turnpike, Lancaster

Future Safety Improvement Projects at HCLs:

- **Table 4-21** below shows that as of the end of 2015, a total of 105 HCLs occurred in Member Communities.
- The HCLs were distributed among 12 Member Communities.
- 82% (86 of 195) of the HCLs occurred in three Member Communities (Fitchburg, Gardner, Leominster).

Table 4-21: HCLs Per Member Communities

COMMUNITIES (Com)	# of HCLs Per Com
ASHBY	1
FITCHBURG	39
GARDNER	12
GROTON	1
HARVARD	1
LANCASTER	7
LEOMINSTER	35
LEOMINSTER & FITCHBURG (City Line)	1
LUNENBURG	1
SHIRLEY	1
STERLING	4
TOWNSEND	1
WINCHENDON	1
MMPO REGION TOTAL:	105

- **Table 4-22** below is a list of the top 18 HCLs (of 105 HCLs) in the region.
- An HCL needed a combination of at least eight Injury crashes and 31 Property Damage Only crashes to be included in **Table 4-22.**
- 67% (12 of 18) occurred in two Member Communities (Fitchburg and Leominster).
- 17 HCLs were forwarded from 2014 while one HCL was added to the Table.
- In 2015-
    - one HCL coincided with a Bike HCL
    - one HCL coincided with a Ped HCL
- Road Safety Audits have been completed at Six HCLs
- Projects have either been initiated or completed at seven HCLs
- To continue to improve safety at HCLs, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact the MRPC for the HCLs within their community.
- MRPC will contact Member Communities concerning the HCLs for further study and potential project development.
- HCL data is updated by MassDOT which may add locations as HCLs, or previous year HCLs may be eliminated.

Table 4-22: Top 18 HCLs in Member Communities

COMMUNITIES	LOCATION NAME	2014 TABLE	BIKE HCL 2015	PED HCL 2015	Top 200 2015	Top 200 2016*	RSA Completed	Project Initiated or Completed
FITCHBURG	WATER STREET (SR12 NB) at WANOOSNOC ROAD	•			•	•		
	BOULDER DRIVE at MAIN STREET (SR2A EB)	•		•			•	•
	SOUTH STREET at WANOOSNOC ROAD	•			•		•	
	WHALON STREET at PIERCE AVENUE	•			•			
	WATER STREET (SR12 NB) at BIRCH STREET	•						
	FRANKLIN ROAD at OAK HILL ROAD	*NO*					•	•
GARDNER	PEARSON BOULEVARD at UNION SQUARE	•			•			
	TIMPANY BOULEVARD (SR68 NB)	•						
HARVARD	AYER ROAD (SR110 EB) at CONCORD TURNPIKE (SR2 EB)	•						•
LANCASTER	ROUTE 2 (SR2 EB) at JACKSON ROAD	•						•
LEOMINSTER	ROUTE 2 (SR2 EB) at RAMP-RT 12 NB TO RT 2 WB	•						
	NORTH MAIN STREET (SR12 NB)	•			•			
	MAIN STREET (SR13 NB) at NASHUA STREET	•	•		•		•	•
	NORTH MAIN STREET (SR12 NB) at HAMILTON STREET	•					•	•
	ROUTE 2 (SR2 EB) at MEAD STREET	•						
	ROUTE 2 (SR2 EB) at MERRIAM AVENUE	•						
SHIRLEY	TOWNSEND ROAD at GROTON ROAD (SR225 EB)	•						
STERLING	LEOMINSTER ROAD (SR12 NB) at CHOCKSETT ROAD^	•					•	•

*Top 200 statewide (MassDOT). MassDOT changed the HCL methodology for 2016

^roundabout project recently completed and will need to be evaluated in the future

- **Table 4-23** below includes 12 HCLs (of the remaining 87 HCLs) that coincided with the remaining Bike HCLs or Ped HCLs in Member Communities.
- The Athol location was an HCL prior to, but not in, 2015. However, the location coincided with a Bike HCL and a Ped HCL in 2015.
- To improve safety at HCLs or a location with a Bike HCL and/or a Ped HCL, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact the MRPC for the HCLs/Bike HLC/Ped HCL within their community.

- MRPC will contact Member Communities concerning the HCLs/Bike HLC/Ped HCL for further study and potential project development.
- HCL/Bike HLC/Ped HCL data is updated by MassDOT which may add locations as HCLs/Bike HLC/Ped HCL, or previous year HCLs/Bike HLC/Ped may be eliminated.

Table 4-23: HCLs with Coinciding Bike and/or Ped HCL in 2015

COMMUNITIES	LOCATION NAME	2014 TABLE	BIKE HCL 2015	PED HCL 2015	RSA Completed	Project Initiated or Completed
ATHOL	MAIN STREET (SR 2A EB) at EXCHANGE STREET	●	●	●	☐	☐
FITCHBURG	MAIN STREET (SR2A EB)	●		●	☐	☐
	MAIN STREET at MILL STREET	●		●		
	MAIN STREET at WATER STREET	●		●	●	●
	MAIN STREET at CUSHING STREET	●		●		
GARDNER	MAIN STREET (SR68 NB) at WILLOW STREET	●		●	☐	☐
	MAIN STREET (SR68 NB) at TIMPANY BOULEVARD (SR68	●		●	●	●
	TIMPANY BOULEVARD (SR68 SB)	●		●		
LEOMINSTER	WEST STREET at PARK STREET	●		●		
	MAIN STREET (SR12 NB) at MONUMENT SQUARE (SR12	●		●		☐
	MAIN STREET (SR13 NB) at PROSPECT STREET	●	●		●	●
	MAIN STREET (SR13 NB) at RIVER STREET	●	●		●	●
	MECHANIC STREET at WATER STREET	●		●	●	●

*not an HCL in 2015

Safety Trends

Even as the regional population and number of vehicles on the roadways continues to increase, total fatality crashes have not increased. Incapacitating injury crashes decreased significantly but non-motorized crashes increased slightly and total overall crashes continue to rise. It has been proven that the safety projects have resulted in a reduction of crashes and the projects mentioned above are now no longer listed on the high crash listing. It is because of this that serious crash locations will continue to be a focus of the safety planning efforts for the MRPC.

Safety Recommendations

Future Safety Improvement Projects at Fatality Locations

- **Table 4-24** below shows five Fatal Crash Corridors (FCCs) where two or more Fatalities occurred in Member Communities from 2012 – 2014.
- The MRPC maintains an FCC Table that currently contains 42 FCCs.
- No RSAs or Projects have been undertaken at FCCs.
- Member Communities may choose to contact the MRPC for the FCCs within their community.
- MRPC staff will contact Member Communities concerning the FCCs for further study and potential project development.

Table 4-24: Fatal Crash Corridors with Two or More Fatalities

COMMUNITIES	FATAL CRASH CORRIDORS	Fatal	Injury	PDO	Total Corridor Crashes	RSA Completed	Project Initiated or Completed
Ayer	Route 2A & Washington Street	2	18	57	*77*		
Fitchburg	Route 2A Westminster Street	3	20	70	*93*		
Fitchburg &	Route 31, Fitchburg/Ashby (south)	3	19	92	*114*		
L & L*	Rt 13 Electric Ave Main Street	2	35	121	*158*		
Westminster	Route 2A State Road West	2	4	6	*12*		
	TOTAL CRASHES				*454*		
	Total Crashes by Severity	*12*	*96*	*346*			
	Percentage Total Crashes by Severity	*2.6%*	*21.1%*	*76.2%*			

*Lunenburg & Leominster

Future Safety Improvement Projects at High Crash Locations (HCLs):

- **Table 4-25** below is a list of the top 13 HCLs in Member Communities without a Project.
- An RSA has been completed at one HCL.
- **Table 4-26** below is a list of the seven HCLs (of the remaining 87 HCLs) that coincided with the remaining Bike HCLs or Ped HCLs in Member Communities without a Project. No Project has been undertaken at the Athol HCL where coinciding Bike and Ped HCLs occurred.

- The MRPC maintains an HCL Table that currently contains 105 HCLs.
- To continue to improve safety at HCLs, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact the MRPC for the HCLs within their community.
- MRPC staff will contact Member Communities concerning the HCLs for further study and potential project development.

See the **Financial Analysis** chapter for the estimated cost of the projects listed in the FCC Table and the HCC Table.

Table 4-25: Top 13 HCLs in MMPO Member Communities

COMMUNITIES	LOCATION NAME	2014 TABLE	BIKE HCL 2015	PED HCL 2015	Top 200 2015	Top 200 2016*	RSA Completed
FITCHBURG	WATER STREET (SR12 NB) at WANOOSNOC ROAD	•			•	•	
	BOULDER DRIVE at MAIN STREET (SR2A EB)	•		•			☐
	SOUTH STREET at WANOOSNOC ROAD	•			•		•
	WHALON STREET at PIERCE AVENUE	•			•		
	WATER STREET (SR12 NB) at BIRCH STREET	•					
	FRANKLIN ROAD at OAK HILL ROAD	*NO*					☐
GARDNER	PEARSON BOULEVARD at UNION SQUARE	•			•		
	TIMPANY BOULEVARD (SR68 NB)	•					
LEOMINSTER	ROUTE 2 (SR2 EB) at RAMP-RT 12 NB TO RT 2 WB	•					
	NORTH MAIN STREET (SR12 NB)	•			•		
	ROUTE 2 (SR2 EB) at MEAD STREET	•					
	ROUTE 2 (SR2 EB) at MERRIAM AVENUE	•					
SHIRLEY	TOWNSEND ROAD at GROTON ROAD (SR225 EB)	•					

*Top 200 statewide (MassDOT). MassDOT changed the HCL methodology for 2016

Table 4-26: HCLs with Coinciding Bike and/or Ped HCL in 2015

COMMUNITIES	LOCATION NAME	2014 TABLE	BIKE HCL 2015	PED HCL 2015	RSA Completed
ATHOL	MAIN STREET (SR 2A EB) at EXCHANGE STREET*	•	•	•	☐
FITCHBURG	MAIN STREET (SR2A EB)	•		•	☐
	MAIN STREET at MILL STREET	•		•	
	MAIN STREET at CUSHING STREET	•		•	
GARDNER	MAIN STREET (SR68 NB) at WILLOW STREET	•		•	☐
	TIMPANY BOULEVARD (SR68 SB)	•		•	
LEOMINSTER	WEST STREET at PARK STREET	•		•	
	MAIN STREET (SR12 NB) at MONUMENT SQUARE (SR12 NB)	•		•	

*not a HCL in 2015

BICYCLE & PEDESTRIAN

Increasing concern for air quality, energy conservation, rising fuel costs, and the health benefits of getting outdoors is generating continued interest in multi-modal transportation in the Montachusett Region and throughout the state. In fact, as part of the public outreach that was done for this RTP, pedestrian and bicycle accessibility came up within the top four of most important categories for the region to address. The MRPC has been working toward a more sustainable transportation system by educating and promoting transportation mode choice throughout the region. This section will review existing and proposed Bicycle and Pedestrian transportation alternatives while focusing on the importance of mode shift.

Existing Infrastructure

Bikeways

Bikeways are special routes and/or facilities established to facilitate the movement of bicycles as an energy efficient transportation and/or recreational mode of travel. Bikeability is a measure of how well an area encourages biking for everyday trip purposes.

In 2019 MassDOT updated the "Massachusetts Bicycle Transportation Plan". This plan consists of an overview, a roadmap which includes the vision, goals and principles, as well as initiatives and an action plan. As a part of this update development, MassDOT also developed the "Municipal Resource Guide for Bikeability" to go along with the updated Bike Plan. This plan is meant to assist communities in enhancing community bikeability and includes additional resources.

The Vision, Goals and Principles identified in the updated Bike Plan include –

Vision – Biking in Massachusetts will be a safe, comfortable, and convenient option for everyday travel.

- Goal 1 – Create high-comfort connected bike networks for people of all ages and abilities.
- Goal 2 – Increase the convenience and attractiveness of everyday biking.
  - Principle 1 – Treat all people the same regardless of travel mode
  - Principle 2 – Address gaps and barriers known to discourage everyday biking
  - Principle 3 – Lead by example and partner with municipalities to advance everyday biking

MassDOT developed a Capital Investment Plan (CIP) to manage funding that works towards this vision. This plan includes projects such as small-scale maintenance projects to large-scale multimodal modernization projects. All projects are scored based on their anticipated benefits in order to determine investment priorities. Additional programs include Complete Streets Funding Program, the Chapter 90 Program, the Multi-Use Pathways Program and the MassTrails Funding Program.

Bikeway Projects in the Montachusett Region include –

See Map "Bikeway Projects in the Montachusett Region" in the appendix of this document.

- **Mass Central Rail Trail** (MCRT)– (Clinton/Sterling) This trail has been extended to Sterling Center along the Fitchburg & Worcester RR right-of-way, which ran from Sterling Junction through Sterling Center to Pratt's Junction. An estimated 21 miles of this trail are already open. The Sterling section is complete from Gates Road (where there is parking) north across the Quag bridge to the Sterling Cider Mill (where there is parking) at Waushacum Avenue/Newell Hill Road. It is hoped that the Sterling rail trail can be extended through Sterling Center north to the Police Station. MasDOT's recent construction of a roundabout at Route 12 and Chocksett Road, a second roundabout at I-190 Exit 6, with lane reductions, and additional pedestrian and bicycling accommodations offers the potential for safe extension of the route further north. The general direction of the Sterling Spur of the MCRT offers the potential to connect to the recently-funded Twin Cities Rail Trail in Fitchburg/Leominster.

The Mass Central Rail Trail is planned to extend from Northampton to Boston, and has been completed locally from Rutland to West Boylston (with some gaps). Part of the Sterling trail may likely serve to connect the Mass Central Rail Trail from West Boylston around to the north of the Wachusett Reservoir to Clinton, Berlin, Hudson, etc. and to Boston.

The Clinton/Berlin areas are important components of the MCRT with the 1,000-foot tunnel and the two significant bridges in Clinton and Berlin that would be restored as a part of the over-all trail. The MCRT would be the longest single RR based rail trail in the northeast and at Northampton it is going to connect directly with a North/South trail to New Haven, CT making for a totally sustainable tourism experience for families. Boston to Northampton on the MCRT and then south to New Haven on the Farmington Canal Greenway and then take passenger rail back to Boston.

- **Nashua River Rail Trail** – (Ayer/Groton) This trail is a former railroad right of way that travels 11 miles through the towns of Ayer, Groton, Pepperell and Dunstable. Managed by the Department of Conservation and Recreation, the trail was officially opened to the public on October 25, 2002.

- **North Central Pathway** – (Gardner/Winchendon) This recreational trail connects the communities of Gardner and Winchendon. The trail was broken down into phases to ease the development process.
  - Phase 1 – Dedicated paved trail from Park Street past Crystal Lake to Mount Wachusett Community College (MWCC)
  - Phase 2 – Using existing roads from MWCC, Kelton & Stone Streets to Route 140. This portion of the trail exists only as an on-street connection with signage. Once Phase 6 is completed, this phase will no longer be needed.

- Dunn Park Spur – Existing roads from MWCC to Dunn Park with dedicated connector at the Middle School
- Phase 3 –3.2 miles paved from Route 140 to Old Gardner Road in Winchendon
- Phase 4 – Downtown Winchendon to Glenn Allen Street

- Phase 5 – $1.7 Million-dollar project that consists of 2.1 miles starting at North Ashburnham Road to Glennallen Street (Rt. 202).
- Phase 6 – A $3.1 Million-dollar bridge over Route 140 that is currently in the design process. It is listed on the Draft 2020-2024 TIP for year 2022.
- Phase 7 – Proposed along Park Street to old rail bed, ending where Phase 3 begins.

When completed, this trail will provide the region with a link to many other recreational sites and activities including Dunn Pond, Gardner High School Athletic Facilities, Mount Wachusett Community College, Gardner Municipal Golf Course, the Gardner Veterans Rink, Clark YMCA, Grout Park and many more.

- **Twin Cities Rail Trail –** This 4.5-mile rail trail is currently under the design phase at the time of this document write up. The trail will connect downtown Fitchburg to downtown Leominster via the former CSX railroad bed that parallels Route 12. Due to the complex nature of the trail design, the project was broken up into two phases.

  - Phase 1 **–** This phase will begin to be constructed during FY2020 and will be the main portion of the trail connecting the area of First Street in Fitchburg down to Carter Park in Leominster. This portion of the trail will have two major bridges and many road crossings.
  - Phase 2 - The second phase will consist of a bridge over the Nashua River and existing railroad tracks over to the Intermodal station in Fitchburg and the other end of this phase will continue the trail through Carter Park to Mechanic Street in Leominster.

This phase of the trail is extremely important as it will connect trail users directly to the commuter rail as well as MART transit services.

It is believed that this trail will provide a much-needed multi-modal connection from one city center to the other by providing many different populations, including environmental justice neighborhoods, access to recreation, shopping, medical centers as well as to transit options.

- **Ashburnham Rail Trail** – (Ashburnham) Ashburnham Rail Trail (ART) Inc., a private not for profit, is working along with the Town of Ashburnham toward a goal of a safe, non-motorized route between Ashburnham Center and South Ashburnham. This relatively flat, recreational trail will benefit residents and visitors by providing a safe route along a very busy 2.5-mile section of Route 101 where sidewalks are currently unavailable due to geographic constraints.

  ART, Inc. is working toward two major aspects of this project:

  1. Working with the Town as they complete the engineering and design of the 2.5-mile section of the Rail Trail, which will provide users convenient access to the many existing businesses and service of Ashburnham center, as well as providing excellent opportunity for future growth in this area.

     Along the route, the Rail Trail would offer access to the Post Office, municipal soccer fields, J.R. Briggs Elementary School and the William J. Bresnahan Scouting and Community Center. The Town has purchased the abandoned railroad bed and both the Town and volunteers maintain and improve the trail.

2. At the South Ashburnham termination of the current Rail Trail, the ultimate goal is to connect the Ashburnham Rail Trail to the North Central Pathway of greater Gardner and Winchendon via the abandoned Cheshire Branch of the former Boston & Maine Railroad. With this connection, Ashburnham would be a major entryway to a tri-state network of rail trails.

Progress on the 2.5-mile section of the trail has been difficult, slow and expensive. However, the piece described above is vital to the overall goal of the ART, Inc. and Ashburnham's future economic development.

To date, the Town has acquired ownership and/or rights to the majority of segments that comprise the Rail Trail. In 2007 and with support of Ashburnham residents at Town Meeting, a 25% Design Plan Technical Proposal was completed for one section of the Rail Trail and an application for an Abbreviated Notice of Resource Area Delineation was submitted to the Ashburnham Conservation Commission. To move the project forward, the Department of Transportation must deem the project viable. If so, the Town must complete 100% of the design plan for the entire 2.5-mile route before receiving state funding to complete the project.

Challenges that lie ahead for completion of the Rail Trail include:

- Parking and access point delineations
- Clearing, grading and surface preparation
- Bridge surface reconstruction at Whitney Pond
- Bridge construction or bypass at the washed-out gulley behind the soccer fields
- Road crossing measures at Rt. 101
- Municipal, State and Federal permitting
- Applying for and receiving state and federal grant funding

The financial and economic situation has left Ashburnham and ART, Inc. with few options of moving forward with these expensive and major projects. Funding and grant money are limited for such a short but vital section of rail trail. That is why the Cheshire Line is such an important piece of the plan.

With greater awareness of the incredible asset they have in Ashburnham, ART, Inc. hopes to keep their dream of a Tri-State Rail Trail alive.

- **Squannacook River Rail Trail** – (Townsend/Groton) The construction of the Squannacook River Rail Trail is on track to begin in November 2019. The capital campaign has raised $134,000, and anticipates passing its $150,000 goal before November. As of June 1, 2019, permitting is completed at the state level and in the town of Groton, and is nearing completion in Townsend. Because the rail trail passes through turtle habitat, construction is limited to the November to March time period.

  When completed, the Squannacook River Rail Trail will be 3.7 miles long through the towns of Townsend and Groton, running between the Bertozzi Wildlife Area in Groton and Depot Street in Townsend center. This multi-use recreational trail will parallel the scenic Squannacook River and will connect the town centers of Townsend Harbor and Townsend Center, two historical districts, two shopping centers, the North Middlesex Regional High School, and several major open space/ conservation areas (notably Townsend State Forest and the Squannacook River and Ash Swamp Wildlife Management Areas). In Townsend, this trail closely parallels the bicycle and pedestrian unfriendly Route 119, providing a long-desired safe alternative to that state highway for non-motorized travel. The surface will be stone dust, with a 10-foot width.

  The rail bed is owned by the MBTA, and was leased in March 2015 by the non-profit Squannacook Greenways. Squannacook Greenways was the first non-profit in the state of Massachusetts to sign a lease to construct a rail trail with the MBTA. Much more information is available at sqgw.org.

In 2019, the Squannacook Greenways, Inc. received MassTrails funding to continue efforts in project development. This particular funding will be used for a) tasks required for compliance with the Orders of Conditions received from the Groton and Townsend Conservation Commissions, b) trailside signage to display safety, regulatory, accessibility, and resource protection information, c) trailside appurtenances including kiosk, bollards and benches.

Pedestrians

Like the roadway projects in the region, pedestrian facilities in the Montachusett Region are also limited due to a lack of funding. During these tough economic times, communities tend to focus their monies elsewhere. Local communities have expressed interest and support of improved pedestrian ways, often in connection with potential bikeways, but they lack adequate funding for the design and construction of these facilities.

As mentioned in the bicycle section above, in addition to the Massachusetts Bicycle Transportation Plan, the state of Massachusetts also created the Massachusetts Pedestrian Transportation Plan in 2019.

The Vision, Goals and Principles identified in the updated Pedestrian Plan include:

Vision – All people in Massachusetts will have a safe, comfortable, and convenient option to walk for short trips.

- Goal 1 – Eliminate pedestrian fatalities and serious injuries

- Goal 2 – Increase the percentage of short trips made by walking

Principles

1. Value people walking and their travel needs, especially the most vulnerable – children, elderly, people with disabilities – to ensure they can walk safely.
2. Prioritize improvements for people walking by proactively addressing gaps and barriers that discourage walking and are known to increase the likelihood of crashes.
3. Lead the Commonwealth in meeting the pedestrian plan goals by supporting local municipalities and other agencies to increase everyday walking.

In the 2020 Montachusett Unified Planning Work Program (UPWP), there is a Regional Bike and Ped plan task. This task will include the development of both a Regional Bike Plan and a Regional Pedestrian plan. The MRPC will be sure to incorporate the data from the statewide plans into both of these documents as well as the information and recommendations that were included within this Regional Transportation Plan.

Sidewalks

The majority of the communities in the Montachusett Region are rural in nature with small downtown areas. The areas typically contain sidewalks within the major activity centers. The urban communities have a more extensive infrastructure within the central business districts that facilitates pedestrian circulation. Efforts have been made to improve pedestrian access by means of sidewalk improvements, crosswalk delineation, and construction of handicapped ramps, improved lighting, and connections to municipal parking lots. Designated fixed route bus stops are also common along the sidewalks providing a connection between different modes of travel.

Trails

Using Unified Planning Work Program (UPWP) funds, the MRPC was able to conduct a region wide trail inventory starting in 2005 and finishing in 2011. Through public outreach, local meetings and data collection, the MRPC was able to gather trail data for each of their 22 communities plus Devens. This data was broken down into three categories:

- Existing Formal – Trails that are open to the public.
- Existing Informal – Trails that exist but are not open to the public. These trails are likely on private or environmentally sensitive land.
- Potential – These are trails that are not currently in existence but that have potential for development in the future.

In 2012, the trail inventory data was updated through community outreach and field investigation. A Montachusett Regional Trail Guide was then created with the updated trail data in 2014. This guide includes all of the Existing Formal Trails along with local cultural and historical points of interest. The first guide consisted of 10,000 printed copies that were distributed throughout the region. These guides were so popular that they were all dispersed in just over a few years.

In 2019, the MRPC, with the help of the Montachusett Regional Trails Coalition (MRTC), updated existing trail data once again and published an updated Montachusett Regional Trail Guide. At the time of this document, the MRPC currently has approximately 750 miles of existing formal trails throughout the region.

Resources & Funding

MassDOT developed the Capital Improvement Plan (CIP) which will allow the state to develop and implement the Commonwealth's transportation investment strategy. This plan includes a magnitude of projects and project types – from small-scale maintenance projects to large-scale multimodal modernization projects. All projects listed in the CIP are subject to the MassDOT Healthy Transportation Policy Directive which requires the incorporation of walking, bicycling, and transit in all projects.

Funding sources for multi-modal projects include:

- Complete Streets
- Chapter 90
- Shared Use Path Program

- Safe Routes to School
- MassTrails Grants

Working with the Montachusett Regional Trail Coalition

The MRPC is partnered with the Montachusett Regional Trail Coalition (MRTC) in support of their mission "To advance local and regional connectivity, community commitment, and enthusiasm for trails in the Montachusett Region." This mission was re-established during a strategic planning process that was made possible in part by a grant from the Community Foundation of North Central Massachusetts. During this process, a vision statement, guiding principles and goals were also established-

Vision Statement

MRTC envisions:

- fostering trail connections in and around the Montachusett region;
- serving as a centralized resource for regional trail planning;
- helping our communities see trails as essential infrastructure.

Guiding Principles

MRTC advances the development of diverse, high-quality shared-use trails and greenways that are sustainable and accessible:

- Collaboration - Seek participation of diverse stakeholders who represent the communities we serve.
- Connectivity - Advocate for trail linkages within and between communities to bring people and places together in the region.
- Accessibility - Provide trail experiences for people of all abilities and ages.
- Sustainable Development - Commit to developing trails that protect the environment and meet user needs through best management practices.
- Economic Vitality - Support the local economy by putting North Central Massachusetts on the map as a recreational and tourist destination.

- Healthy Lifestyles - Encourage the health, fitness, and well-being of residents by providing multimodal trail opportunities.
- Awareness & Education - Work to make trails a part of the community fabric, connect people with the natural world, and provide outdoor learning experiences for people of all ages.

Goals

- Goal 1 – Identify, secure, and appropriately utilize the human and financial resources necessary to carry out the work of the strategic plan.
- Goal 2 – Develop and implement a marketing plan that targets the proper audiences, strengthens brand awareness, and supports MRTC's mission.
- Goal 3 – Promote trail connectivity and usage throughout the region by identifying and acting upon opportunities for outreach, education, and advocacy.

The MRTC has been instrumental in gaining public involvement, education, and working with MRPC to identify trail gaps and priorities. Some of the significant trail projects that have been identified include:

1. Connecting the Twin Cities Rail Trail from its terminus in Leominster south to Sterling where it would connect to the Sterling Spur and the Mass Central Rail Trail.
2. Connecting the North Central Pathway in Winchendon to the Ashburnham Rail Trail to the south
3. A Gardner to Athol connection that has yet to be determined

Sidewalk Inventory & Pedestrian/Bicycle Connections for MART Bus Routes

This study focused on the Cities of Fitchburg, Gardner and Leominster, in particular, the major fixed bus routes within these communities. The goal was to find and prioritize areas where there are gaps in accessing the bus routes. The study area was defined by the areas within ¼ mile of the bus routes.

As part of the process, a sidewalk inventory was conducted within this study area, and trail data was also included to show transportation alternatives. Data was gathered regarding special populations and points of interest were noted. All of these data sets were mapped and assisted in the prioritization of key areas. See Map "Pedestrian & Bicycle Priority Areas" in the appendix of this document.

Priority areas for each community included:

- Fitchburg State University (Fitchburg) – This area was listed as one of the top bus routes (Route 4), is located in both of the top five specialty population block groups, and incorporates a major continuing education facility in the area. John Fitch Highway is also a major roadway in the City of Fitchburg (12,000-20,000 avg. vehicles per day). There is also recreational trails nearby at Coolidge Park and Fitchburg State University's athletic fields.

- Leominster Hospital (Leominster) – This area incorporates both elderly and disabled populations, is located on one of the top bus routes (Route 2) and travel routes (North Main Street (Rt. 12) - average of 15,000-30,000 vehicles per day), includes a major medical facility and shopping plazas as well as low income and/or elderly housing facilities.

- Johnny Appleseed Plaza (Leominster) – This is a large area that mostly encompasses Central Street (Route 12) along bus route 9 in the area of Johnny Appleseed Plaza and Willard Street, which connects over to the Walmart shopping area. This section includes both top populations of elderly and individuals with disabilities, low income and/or elderly housing facilities, shopping plazas, and a possible trail connection on the east side of the plaza.

- Parker Pond (Gardner) – This area is located in both of the top five specialty population block groups and is located in between two major routes, Route 68 and 101. The smaller

side streets to the east of Parker Pond do not currently have sidewalks. The bus route connects the two routs via Foss Road and Robillard Street. Connections from the smaller side streets near Parker Pond to the bus route and major roadways would be ideal.

- Timpany Plaza (Gardner)– The area just north of Timpany Plaza is listed as having both disabled and elderly populations and is one of the top 5 block groups for elderly residents. It is located within walking distance to the bus route along both Timpany Boulevard and Pearson Boulevard. Both of these locations have many points of interest such as shopping and restaurants and recreational fields/playgrounds.

- Gardner Plaza Shopping Center (Gardner) – The Gardner Plaza is located just off of Route 2 to the north. There are shops and restaurants located here as well as along Pearson Boulevard. There are also two nursing homes and an elementary school located within close proximity. The main focus area is east of Elm Street which is just north of the plaza.

Trends

The desire for more multi modal transportation options within the Montachusett Region has increase significantly over the past few years. More people are seeing the value in having these types of transportation options and are also advocating for the development of new, safer, bicycle and pedestrian facilities throughout the region. Programs such as Complete Streets and Safe Routes to School are gaining support from our communities -

- Complete Streets – 17 out of 22 communities have approved policies, and 8 have received funding for multi modal projects
- Safe Routes to School – 16 out of 22 communities are partners with the program

The State is also contributing financially to trail projects through the MassTrails Grant program. This program provides grants to support recreational trail and shared use pathway projects across the Commonwealth. These grants are reviewed and recommended by the Massachusetts Recreational Trails Advisory Board and the Commonwealth's Inter-Agency Trails Team. There are two funding sources for the grant –

1. Recreational Trails Program (RTP) – these grants are federally funded through the Federal Highway Administration (FHWA), administered at the State level, and provide funding for the development and maintenance of recreational trail projects, both motorized and non-motorized.
2. Commonwealth Trails Grants – "These grants are supported by the State's annual Capital Investment Plan (CIP) and aim to help communities design, create and maintain off-road shared-use pathway connections between where Massachusetts residents live, learn, work, shop and recreate, especially by building out the longer distance regional networks of multi-use pathways across the state and filling in critical gaps in existing networks, or overcoming current barriers to connectivity." (www.mass.gov/guides/masstrails-grants)

In 2019, five communities within the Montachusett Region received MassTrails funding – Athol, Fitchburg, Groton, Lunenburg, and Townsend.

Another notable funding source is the Congestion Mitigation and Air Quality Improvement Program (CMAQ) which provides federal funding for states to support projects and programs intended to improve air quality and reduce traffic congestion. Example projects include – traffic flow improvements, public transit services and facilities, bicycle and pedestrian facilities and programs, rideshare activities, etc. The Twin Cities Rail Trail project that is currently scheduled in the FY 2020 & FY 2021 Transportation Improvement Plan was funded through this funding source.

Recommendations

As these multi modal trail and bikeway projects continue to be studies and developed, funding is always a major component. Increasing the existing funding programs and available dollar amounts are always critical to further these regionally significant projects. Additionally, continuing the study and planning of trail related developments in order to identify priority trails and trail connections are also key for alternate modes of transportation.

ECONOMIC VITALITY

The MRPC is committed to the goal of improving economic vitality in the Montachusett Region by focusing on improving the transportation infrastructure that services the diverse economic drivers within the Region. The *Economic Vitality Needs* dialog below provides a snapshot of the existing transportation infrastructure critical to the economic vitality of the Montachusett Region that should be the focus of future improvement.

Economic Vitality Needs

One of the ten federal requirements for the Massachusetts 2018 Freight Plan, as well as for all state freight plans across the United States, was to develop two freight corridor listings:

- **Critical Rural Freight Corridors (CRFCs)**: Public roads not in an urbanized area which provide access and connection to the *Primary Highway Freight System* (PHFS) and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities.
- **Critical Urban Freight Corridors (CUFCs)**: Public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities.

Purpose and Implications of CUFCs and CRFCs

MRPC Highways that Facilitate Regional Freight Traffic for the MRPC Region (Regional Freight Corridors):

Massachusetts highways that facilitate inbound and outbound freight traffic in Massachusetts:

- Five major Interstate corridors: Interstates 84, 90, 91, 93, and 95;
- Seven auxiliary routes: Interstates 190, 290, 291, 391, 295, 395, and 495;
- Seven major non-Interstate corridors include US-3, US-6, MA-2, MA-3, MA-24, MA-128, and MA-146

Of the above Highways, the following are Regional Freight Corridors:

- I-190 and MA-2

- I-190 and MA-2 form an interchange in Leominster at MA-2 Exit 33 and I-190 Exit 8

The following highways provide access and egress for the Regional Freight Corridors from outside the MRPC Region:

- For MA-2 - I-495 at MA-2 at Exit 29 in Littleton, I-91 at MA-2 at Exit 27 in Greenfield;
- For I-190 - I-290 at I-190 at Exit 19 and Exit 20 in Worcester

I-91 also provides freight traffic access and egress for the MRPC Region at Exit 16 for Route 202

I-495 also provide freight traffic access and egress for the MRPC Region at the following Exits:

- I-495 Exits - Exit 26 for Route 62; Exit 27 for Route 117; Exit 28 for Route 111; Exit 30 for Route 2A/110; and Exit 31 for Route 119

Regional Freight Corridors, CRFCs and CUFCs and National Highway Freight Network Funding

- The FHWA defines the National Highway Freight Network (NHFN) for the purpose of prioritizing through routes critical to interstate commerce;
- The Regional Freight Corridors are included in the NHFN;
- The MRPC Region CRFCs and CUFCs (listed below) provide connectivity to the NHFN for manufacturers and consumers in the MRPC Region;
- The Montachusett MPO used its own analysis and discretion to designate their mileage allotment to develop MRPC Region CRFCs and CUFCs to address the greatest regional freight needs;
- The CRFC and CUFC designations increase NHFN in Massachusetts allowing expanded use of National Highway Freight Program (NHFP) formula funds and FASTLANE Grant Program funds for eligible projects that support identified national goals (23 U.S.C. 167(b), 23 U.S.C. 117(a)(2));
- MassDOT directs resources (funds) toward projects that will improve system performance and the efficient movement of freight on the NHFN in Massachusetts;
- By programming these projects using a mix of NHFP and other funds, MassDOT will advance projects on the roadway segments deemed most critical to freight needs by the MPOs;

- Additionally, each project is screened to make sure it meets at least one statutory requirement before NHFP funds are applied;
- After the development of the STIP and CIP, the project list is updated annually

The following CRFC and CUFC freight corridors received MPO endorsement in 2017:

1) **Jackson Road (CUFC)** in Harvard/Devens connects Route 2 to the developing industrial and freight centers at Devens and indirect access to the railroad freight terminal
2) **Barnum Road (CUFC)** in Ayer/Devens provides indirect access to the developing industrial and freight centers at Devens and direct access to the railroad freight terminal
3) **Princeton Road (Route 31) (CUFC)** in Fitchburg allows direct access to the multi-modal facility at Wachusett Station north of Route 2. South of Route 2 it provides access to Pine Tree Power, a biomass power plant.

Figure 4-46 Route 31 Railroad Bridge in Fitchburg

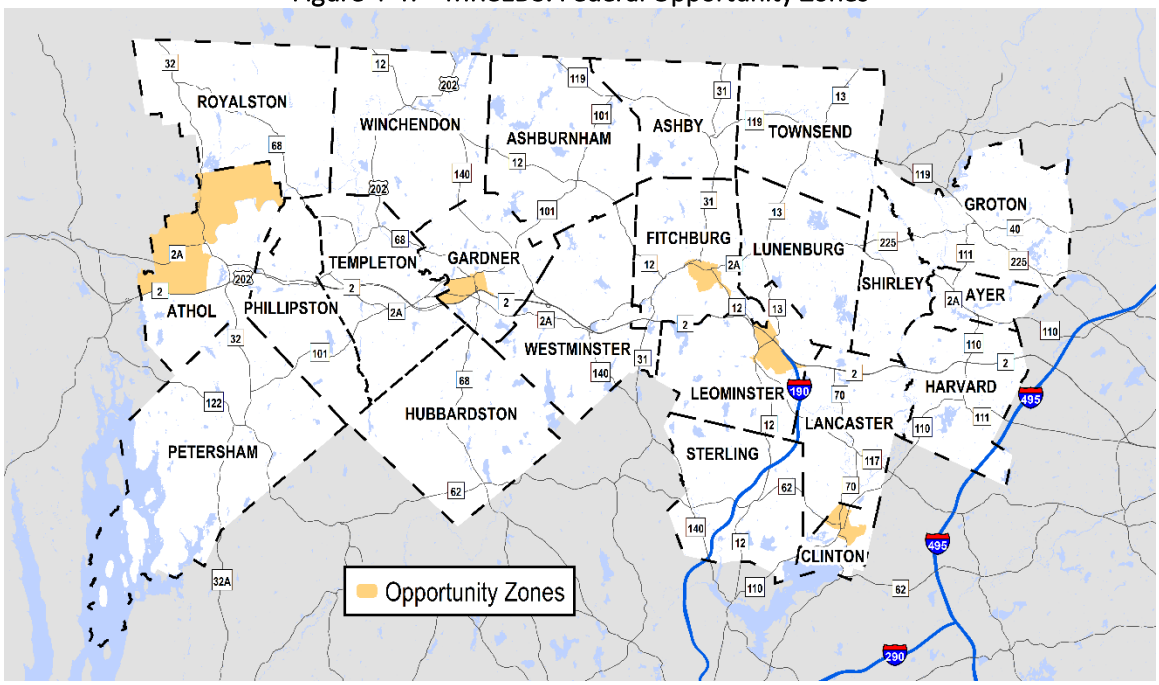
4) **Lunenburg/Fort Pond Road (Route 70) (CUFC)** in Lancaster/Lunenburg allows access from Route 2 to mining facilities at P.J. Keating, a manufacturer of construction earth products and installer of hot mix asphalt, and its mines and truck terminals.

5 & 6) Route 2 (CRFC) segments in Harvard, Phillipston and Templeton. Route 2 is the main east-west corridor in the MRPC region. It is parallel to significant freight and commuter rail infrastructure as well as connecting the regional industrial centers of Devens, Leominster, Fitchburg and Gardner. Route 2 connects to interstates I-495, I-190 within the region and I-91 to the west.

7) Route 111 (CRFC) from Route 2 through the Town of Harvard is a connection between two PHFS, Route 2 in Harvard and I-495 in the Town of Boxborough.

The *Montachusett Region Comprehensive Economic Development Strategy* (MRCEDS) provides a description of the federal *Opportunity Zone* program and the *Opportunity Zones* that are within the Montachusett Region. Opportunity Zones are census tracts generally composed of economically distressed areas. Ten census tracts were approved within five communities in the Region. The Opportunity Zones are distributed evenly (two each) among the following communities – Athol, Clinton, Fitchburg, Gardner, and Leominster (Figure 4-47).

Figure 4-47 - MRCEDS: Federal Opportunity Zones



The ongoing *Athol Route 2 Interchange Study* evaluates the feasibility of a new interchange project on Route 2 at South Athol Road where Athol is seeking to initiate an interchange project. The proposed interchange project falls within the Athol Opportunity Zone that includes Route 2 as does much of the study area for the interchange study.

The MRPC road network constraints are a land use conflict that impact, or potentially impact, economic vitality. The constraints include:

- Congested roads and bottlenecks, include at-grade railroad crossings.

- Economic vitality is hindered by the same congested roads and bottlenecks that affect all traffic in the Montachusett Region. Refer to the *Systems Preservation* section of this document for a more detailed description of the congested roads and bottleneck constraints.
- Railroad at-grade crossings also present a potential congested road and bottleneck problem in several municipalities throughout the region.

- Roadway safety, include safety at at-grade railroad crossings.
  - Economic vitality is hindered by the same fatal crash corridors and high crash locations that affects all traffic in the Montachusett Region. Refer to the Safety Needs section of this document for a more detailed description of the safety constraints.
  - Railroad at-grade crossings also present a potential safety problem in several municipalities throughout the region.

The MRPC will continue to work with the Montachusett Region Trail Coalition (MRTC) to improve the transportation infrastructure that services the regional recreational destinations. Refer to the *Bike & Pedestrian* section of this document for a more detailed description of the transportation infrastructure constraints of the regional recreational destinations.

Future Economic Vitality Improvement Projects and Activities

- Improve freight truck access on the four CUFCs and three CRFCs
- Improve external and internal freight truck access for the 10 Opportunity Zones
- Improve congested roads and bottleneck locations
- Improve safety on fatal crash corridors and at high crash locations
- Improve external and internal access to the regional recreational destinations
- MRPC will continue conducting freight corridor analyses

See the *Financial Analysis* chapter for the estimated cost of the projects listed above.

Guidance Plans

The following plans provided guidance for the completion of this Economic Vitality document.

Massachusetts 2018 Freight Plan (MFP):

The MRPC will seek to apply the MFP recommendations to the Montachusett Region. The MFP (4/18) follows a "scenario-based analysis" model which recognizes that many plausible futures exist. The MFP identifies drivers of change in the world and the range of ways in which they could progress, and combines these into multiple plausible futures and presents strategies which will allow Massachusetts to thrive across the widest range of outcomes. The MFP is a companion plan to the **Massachusetts State Rail Plan** discussed below.

Massachusetts 2018 State Rail Plan (MSRP):

The MRPC will seek to apply the MSRP recommendations to the Montachusett Region. The purpose of the MSRP is to guide the future of the rail system and rail services in Massachusetts. The Goals of the MSRP are:

1. Maintain existing rail system in a state-of-good-repair, expand accessibility, and preserve railroad rights-of-way
2. Support economic growth throughout Massachusetts and enable the State to compete in the changing global economy
3. Improve the safety and security of the rail system
4. Provide a rail system that is environmentally and financially responsible
5. Improve intermodal connectivity for both passenger and freight rail facilities by stronger coordination between rail system users to promote system use and efficiency
6. Maximize the return on public dollars towards rail investment by maximizing the use of existing rights-of-way

Montachusett Region Comprehensive Economic Development Strategy (MRCEDS):

The MRPC will seek to apply the MRCEDS (2019) roadway infrastructure recommendations to the MMPO Region. The Economic Development Administration (EDA) administers the *Comprehensive Economic Development Strategy* (CEDS) program. The CEDS program was established as an economic development planning tool to assist communities, regions and states to advance economic development activities, programs, and projects. Through CEDS, a qualifying economic development organization works to identify a region's flexibility to adapt to the everchanging global economy, persistent economic distresses and learn to utilize the region's assets to maximize economic opportunity that fosters growth and job creation and retention for the region's residents.

Athol Route 2 Interchange Study

The purpose of this ongoing study is to assist Athol in evaluating the feasibility of a new interchange project on Route 2 at South Athol Road where Athol is seeking to initiate an interchange project. The study is evaluating the potential effects of converting the existing grade separated roads into an interchange on the existing transportation system and on the surrounding environment as well as providing ramp alternatives.

The Interchange project was first identified in the Montachusett 2016 RTP. Since these roads are already grade separated, only ramps would be needed to connect them to create the Interchange. The proposed Interchange project is based on the following comments received from the Town:

- Freight movement in Athol is limited due to railroad bridge height restrictions that results in heavy trucks using side streets and driving through residential areas;
- The North Quabbin Commons commercial development on Templeton Rd (Route 2A) has the potential of producing traffic backups on Route 2 at Exit 18;
- The Interchange would improve heavy truck access and egress to Route 2 for South Athol Road;

- The Interchange would promote economic growth in Athol primarily along the South Athol Road Corridor;
- Heavy truck traffic on smaller local roads would cease thus creating a safer roadway environment in neighborhoods, extending the pavement life of neighborhood roads, and healthier neighborhoods through decreased vehicle exhaust emissions;
- The interchange would improve South Athol Road access and egress to essential community and regional services that includes the following:
    - Athol Fire Department;
    - Athol Hospital;
    - MA State Police Barracks in Athol;
    - Athol High School
- The Interchange would improve school bus transportation

Trends

The Economic Vitality section reveals two existing issues that are facilitating an increasing trend in hindering economic vitality growth in the Montachusett Region:

- Aging railroad bridges, most of which were constructed approximately 100 years ago, are narrow and many have bridge height restrictions. Also, the bridge alignment geometry of many railroad bridges is not aligned with the geometry of the intersecting road creating dangerous S- shaped horizontal curves with poor sight distance
- Many Route 2 interchanges, including their ramps, do not have the capacity to meet traffic volume demand. One new interchange is being proposed

The MRPC recognizes that the transportation network plays an important role in the economic growth of the Region. Many sectors of the economy depend heavily on safe and efficient movement of goods and services by truck.

Recommendations

Future Economic Vitality Projects and Activities

- Improve freight truck access on the four Critical Urban Freight Corridors CUFCs and three Critical Rural Freight Corridors
- Improve external and internal freight truck access for the 10 Opportunity Zones
- Improve congested roads and bottleneck locations
- Improve safety on fatal crash corridors and at high crash locations
- Improve external and internal access to the regional recreational destinations
- MRPC will continue conducting freight corridor analyses

See the *Financial Analysis* chapter for the estimated cost of the projects listed above.

CONGESTION

Congestion occurs at intersections and along road segments throughout the region which adversely impact commuter travel, the efficient movement of goods and air quality. The following areas of congestion were identified through local knowledge, public input from surveys, MRPC studies, identified bottlenecks and various technical data sources.

Congested Corridors

Congestion in the following corridors/locations tends to create the greatest impacts to traffic flow in the region. Inadequate geometrics, right-of-way issues and improper signal timings and/or phases result in poor vehicle flows and, in many cases, unsafe conditions. Concerns will range from local intersections and corridors to congestion on regionally important highways such as Route 2.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner – This highway serves as the second major east-west connector for the Commonwealth and has a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters. Regular resurfacing and maintenance costs are significant in terms of dollars and are usually well beyond the limited federal funds allocated to the Region. There is still a need for an increased investment to maintain Route 2, along with all roadways in the region, in an acceptable condition. The possibility of the section of Route 2 between I-495 and I-190 being incorporated into the interstate system due to its natural connection between these two major routes has been discussed. Designation of this type, i.e. interstate highway, would make this segment eligible for Interstate Maintenance funds. Connections to nearly all major routes in the region exist on Route 2, as does the interchange of Route 2 and I-190. Recent improvements to the pavement striping in this

location seem to have reduced confusion and congestion, although further study is needed.

- Route 12, Fitchburg and Leominster – This main corridor through the cities of Fitchburg and Leominster may be the most congested in the region. Many improvement projects have been completed in recent years to address congestion issues. Most notably were major signal and lane improvements between Bemis Road in Fitchburg and Erdman Way in Leominster completed in 2010. Adequate access to Route 2 often dominates local concerns. The City of Fitchburg continues to maintain the need for improved access between Route 2 and its downtown as a major force in the communities' economic development; this would also serve as a congestion mitigation measure for traffic on surrounding streets and intersections leading into the city from the highway. This concern is echoed by the North Central Massachusetts Chamber of Commerce as one of the major needs for the area as well as the city. Major issues also remain in both downtown areas of Fitchburg and Leominster especially during peak hours. An MRPC study, "*Downton Fitchburg Bottleneck Profile*" (2012), ultimately determined that major signal improvements were needed in that area.

- Route 13 Leominster– This segment was well documented in the 1999 MassDOT Study "Fitchburg/Leominster/Lunenburg Transportation Analysis Project". Although many improvements have been made in the last 20 years this corridor still remains among the regions most congested. Several recommendations were proposed to address congestion as well as safety issues associated with heavy traffic volumes and the poor geometrics of the Route 13/Haws Street/Route 2 interchange. In 2008 the Route 13 Bridge over the North Nashua River was rehabilitated and pedestrian safety improvements were made. In 2010 MassDOT introduced design plans for Route 13 in Leominster between Prospect and Haws Streets, the most congested area of Route 13, which involves a new signal at Route 13 and Mead, as well as signal equipment upgrades and coordination of existing signals. Many amendments to this project have been made since the original concept.

The 2020-2014 Transportation Improvement Program lists this project as being funded in 2020.

- South Street/Merriam Avenue, Fitchburg and Leominster – This corridor serves as one of two major connecting roads between Fitchburg and Leominster in addition to providing direct access to Route 2. Volumes along this corridor are mainly affected by a traffic signal at the Route 2 westbound ramp/Twin City Mall entrance crossing as well as by the Merriam Avenue Bridge over Route 2. Road widths are limited by the bridge and abutting land uses to two travel lanes; one northbound and one southbound. In 2018 MRPC completed the Merriam Avenue – South Street Corridor Bottleneck Study which profiled this area and made recommendations to improve congestion.

- Route 117, Lancaster and Leominster – This state route is a major commuter road that provides access to I-190 at the Leominster/Lancaster line and I-495 in Bolton located east of Lancaster. Most of the congestion along this corridor occurs during AM and PM peak hours. Also causing significant delays is an at-grade freight railroad crossing east of Route 70 in Lancaster which frequently stalls traffic for long periods of time as trains pass through. Within the past 20 years there has been major commercial development on both sides of Route 117 on the Leominster/Lancaster line. These commercial developments have been complemented by various improvements to the roadway including the addition of turning lanes and stop lights allowing easier access to both I-190 and the commercial access roads. MRPC conducted the "Route 117 Corridor Profile" (2014) through the town of Lancaster which suggested major improvements to the intersections of Route 117/Lunenburg Road and Route 117/Main Street. Improvements are scheduled to occur in year 2021 of the 2020-2024 Transportation Improvement Program.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner – Commuter traffic on Route 2 has grown throughout the Montachusett Region. This highway serves as the second major east-west connector for the Commonwealth and has

a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters.

- Downtown Gardner – Route 101 (Central Street/Parker Street) runs east-west through this corridor while Route 68 (Main Street/Parker Street) runs north-south. The layout of this intersection can be confusing to drivers and is a high crash location in the region. Furthermore, traffic routinely backs up through downtown during peak hours. While many variations of geometrics have been tried over the years Right of Way issues make it difficult to make an ideal improvement. Long term efforts may need to involve complete reconstruction and reconfiguration of this intersection.

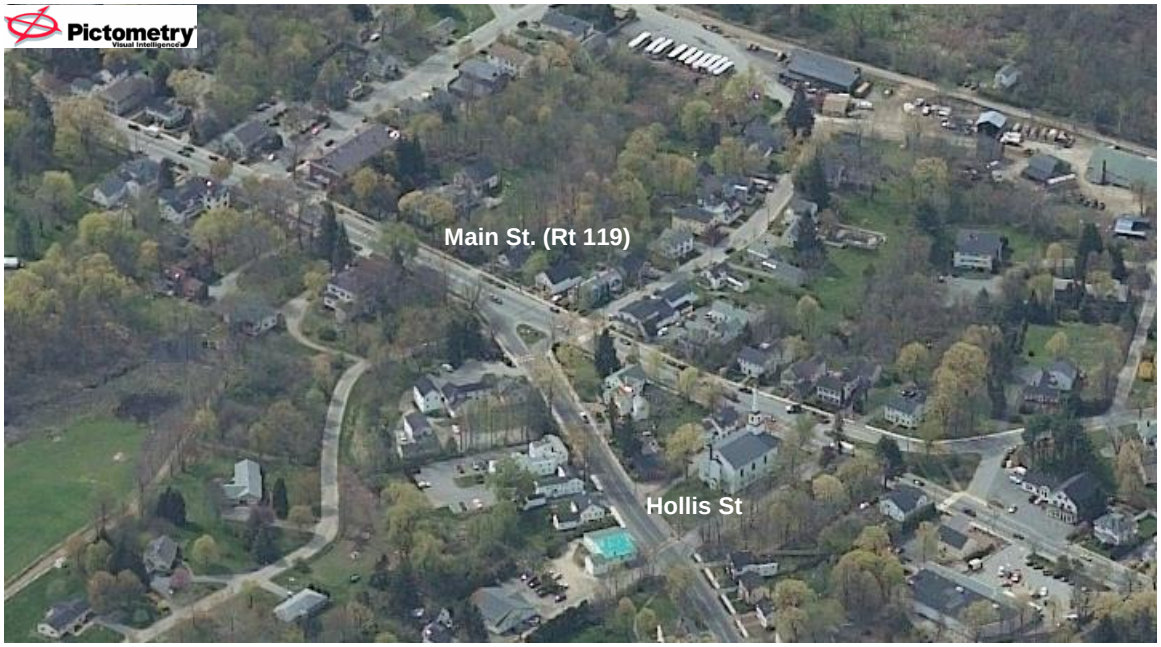
Figure 4-48 - Main Street (Route 68)/Central Street (Route 101) in Gardner Looking North.

- Route 119, Townsend and Groton – This road has become a major commuting route for the northern portion of the Region. Route 119 runs southeast from New Hampshire to I-495 in Littleton to Route 2 at the Concord Rotary. Peak hour flows are heaviest eastbound

in the AM and reversed in the PM reflecting its use as a commuting road to the I-495/Boston area. The route runs through the town centers of Townsend and Groton and as such greatly impacts local travel patterns.

Figure 4-49 – Route 119 in Townsend Looking North

Figure 4-50 – Route 119 in Groton Looking South



- Route 2A, Ayer - from Park Street (Routes 2A/111) to the Littleton town line, includes Main Street, East Main Street, and Littleton Road. Peak hour traffic suffers from slow travel speeds along the Main Street segment through the downtown area due to side street traffic, on-street parking, an MBTA Commuter Rail stop downtown and narrow lanes. A notable intersection in this corridor is Park Street (Routes 2A/111) and Main Street. Park Street traffic looking to continue onto Route 2A east/111 south must stop and wait for a gap in traffic on East Main Street/Main Street which results in long peak hour delays from this approach.

Figure 4-51 - Main Street (Routes 2A/111) in Ayer from Park Street to Columbia Street Looking North

System Analysis

Transportation Studies with Congestion Elements

Member communities regularly request various types of transportation studies which the MRPC conducts through the Unified Planning Work Program (UPWP). Many of these studies involve

examining congestion issues along a roadway or corridor. One of the most useful data sets pertaining to congestion issues is travel time. Travel time data is collected using a GPS Device and TravTime 2.0™, a software program which measures travel time and delays on a roadway. Since MRPC has acquired TravTime software, it has regularly been included in analysis in transportation studies done throughout the region. Numerous travel time runs are taken through the study area. From this, an average travel time can be computed during the peak hour through a particular road or corridor. This data is compared to free flow travel time to depict a travel time index rating. The free-flow travel time is the amount of time in seconds it takes to travel a particular corridor at the posted speed limit without any delay. The travel time index (TTI) is a ratio between the average peak hour travel time and free-flow travel time. For example, a TTI value of 1.30 indicates that the average travel time at peak hour takes 30 percent longer than free flow travel time. The table below shows the different congestion levels of the TTI of an arterial roadway.

Table 4-27 - Travel Time Index (TTI) Levels of Congestion

Functional Class	No/Low Congestion	Moderate Congestion	High Congestion	Severe Congestion
Arterials	< 1.5	1.5 - 2.0	2.0 - 2.6	> 2.6

*Source: Federal Highway Administration

Three recent studies which included travel time analysis have been completed in recent years. Below are descriptions of each of these study areas and results from our Travel Time analysis.

Downtown Fitchburg Bottleneck Profile (2012)

The *Downtown Fitchburg Bottleneck Profile* was an effort to highlight various issues causing one of the most significant bottlenecks in the Montachusett Region – Downtown Fitchburg. Throughout the program year various data was collected and analyzed to draw attention to issues leading to traffic delays in the area.

Study Area

The study area encompasses the downtown area from Moran Square at the intersection of Main (Rte. 2A), Lunenburg (Rte. 2A) and Summer Streets in the east extending west to the area known as the "Upper Common" at the intersection of Main, River (Rte. 31) and Mechanic (Rte. 31) Streets. Traffic along the roadways of Main Street and Boulder Drive, including the intersections with other side streets were considered for this report.

Travel Time

	Run 1	Run 2	Run 3	Run 4	Run 5	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	3.73	3.63	3.73	3.85	3.45	3.08	**1.40**
Westbound (Minutes)	5.7	5.83	4.35	3.95	6.03	5.17	**2.18**
Posted Speed Limit = 25 MPH		Corridor Distance (Miles) = 0.99 WB / 0.92 EB			Free Flow Travel Time (Minutes) = 2.38 WB / 2.21 EB		

From the travel time results it is clear that traveling westbound on Main Street during peak hour entails dealing with a high level of congestion. A major inhibitor of traffic flow through downtown was the lack of a system of properly operating and coordinated network of traffic signals.

Figure 4-52 - Main Street in Fitchburg Looking North

Route 117 Corridor Profile (2014)

The Town of Lancaster requested the Montachusett Regional Planning Commission (MRPC) to conduct a study of Route 117 through the community in the spring of 2013. In its efforts the MRPC in turn has engaged town officials to form an informal Steering Committee to assist, offer guidance and provide local knowledge that would contribute to a Corridor Profile along the road. The goal was to assess the conditions and problems that may exist along Route 117 and offer recommendations and avenues to make improvements where necessary. After much data collection, analysis, site visits and public engagement the MRPC completed the ***Route 117 Lancaster Corridor Profile*** in 2014. As part of the report, multiple Travel Time runs were taken during the measured peak hour times through the entire 4.7 miles of Route 117 in Lancaster.

Travel Time

	Run 1	Run 2	Run 3	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	8.68	8.33	8.93	8.65	**1.15**
Westbound (Minutes)	8.3	8.47	11.95	9.57	**1.28**
Posted Speed Limit = 40 MPH		Corridor Distance (Miles) = 5.0 Miles		Free Flow Travel Time (Minutes) = 7.5 WB / 7.5 EB	

Although congestion did not pose a great issue through the corridor as a whole, the junction of Route 117 and Route 70 and its two major intersections were identified as having long delays for the Route 70 approaches. Improvement alternatives were presented to the town and a project at this location is listed in year 2021 of the 2020-2024 Transportation Improvement Program.

Figure 4-53 - Lancaster Route 117/70 looking North

Merriam Avenue – South Street Corridor Bottleneck Study (2018)

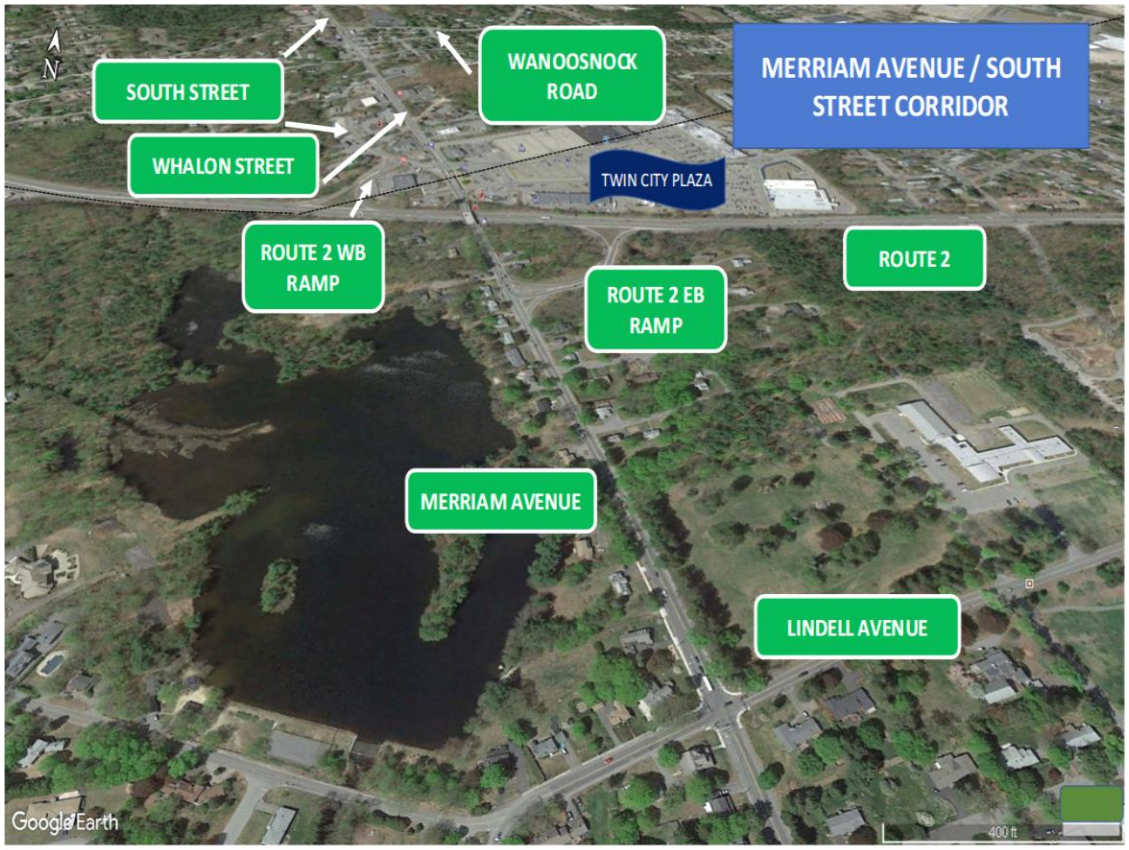
The Merriam Avenue - South Street Bottleneck study stems from a goal set in the 2016 RTP of the to “reduce congestion and improve mobility”. One performance measure set under this goal was to “identify one (1) bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures”. This section of Merriam Avenue and South Street in the cities of Leominster and Fitchburg has long been considered one of the regions congested corridors and is considered a traffic “bottleneck”. The Federal Highway Administration’s (FHWA) definition of a traffic bottleneck is "a localized section of highway that experiences reduced speeds and inherent delays due to a recurring operational influence or a nonrecurring impacting event." This study profiles existing conditions and identifies factors adding to the congestion of the Merriam Avenue - South Street corridor.

Study Area

The study area extends from the south at the intersection of Merriam Avenue and Lindell Avenue in Leominster, to the north at the intersection of South Street and Wanoosnoc road in Fitchburg. The Merriam Avenue - South Street corridor serves as one of two major connecting roads between the cities of Fitchburg and Leominster in addition to providing direct access to Route 2. Contained within this corridor are the following primary locations, listed from south to north, which are the main catalysts for congestion and are highlighted in this study.

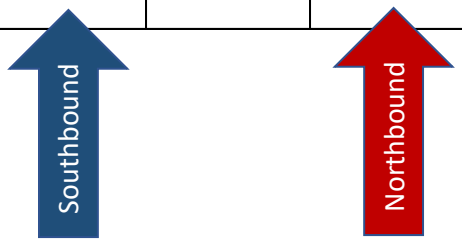
- Intersection of Merriam Ave./ Route 2 East ramp
- Merriam Ave. bridge over Route 2
- Signalized Intersection of Merriam Ave./ South St./ Whalon St./ Twin City Plaza
- Signalized Intersection of South St./ Wanoosnoc Rd.

Figure 4-54 - Leominster/Fitchburg, Merriam Ave/South Street Corridor



Travel Time

Functional Class	No/Low Congestion	Moderate Congestion	High Congestion	Severe Congestion
Arterials	< 1.5	1.5 - 2.0	2.0 - 2.6	> 2.6



Southbound Traffic through the study area measures no or low congestion (TTI of 1.34). Northbound traffic experienced high congestion (TTI of 2.51). The study also considered delay caused by the intersections along the corridor and physical challenges along the road such as the road being limited to two lanes over the route 2 bridge. A number of improvement alternatives were presented in the study.

Continuous Count Stations in Region

The following tables list average daily traffic volumes from MassDOT continuous count stations on major routes (Route 2 and I-190) in the Montachusett region going back to 2001. From these tables the following patterns can be seen.

- Counts have recuperated to pre-recession levels after a period of decline throughout the region in the mid 2000's.
- Steady growth has been occurring throughout the region since 2015
- If the trend of traffic growth continues, increased congestion can be expected, especially during rush hour.

Route 2 Littleton East of Harvard Town Line		
Year	Volume	Growth
2018	54,452	2%
2016	53,207	2%
2015	52,262	9%
2014	47,432	2%
2013	46,642	2%
2012	45,692	0%
2011	45,569	-3%
2010	47,100	-3%
2009	48,540	-1%
2008	48,803	0%
2007	48,800	8%
2006	45,112	-2%
2005	46,229	-1%
2004	46,900	-7%
2003	50,022	-1%
2002	50,603	1%
2001	50,000	
Growth since 2015:		4%

Route 2 Lancaster West of Route 70		
Year	Volume	Growth
2018	59,761	7%
2016	55,471	2%
2015	54,277	6%
2013	50,847	1%
2012	50,113	1%
2011	49,476	-3%
2010	51,104	1%
2009	50,435	5%
2008	47,806	1%
2007	47,186	-1%
2006	47,800	6%
2005	45,104	-3%
2004	46,433	2%
2003	45,454	0%
2002	45,457	
Growth since 2015:		9%

Route 2 Westminster East of Route 140		
Year	Volume	Growth
2018	52,062	2%
2016	50,872	4%
2015	48,912	15%
2014	41,401	2%
2013	40,614	2%
2012	39,880	-6%
2011	42,088	-2%
2010	43,000	1%
2009	42,770	-1%
2008	42,999	3%
2007	41,887	-1%
2006	42,172	-2%
2005	42,991	-1%
2004	43,257	3%
2003	42,168	-1%
2002	42,663	4%
2001	40,923	
Growth since 2015:		6%

Route 2 Athol East of Orange TL		
Year	Volume	Growth
2018	14,910	15%
2016	12,699	9%
2015	11,514	5%
2014	10,965	3%
2013	10,615	-2%
2012	10,826	-5%
2011	11,385	1%
2010	11,274	-30%
2009	14,711	27%
2008	10,740	-2%
2007	11,003	-2%
2006	11,202	0%
2005	11,180	0%
2004	11,127	1%
2003	10,967	2%
2002	10,800	4%
2001	10,415	
Growth since 2015:		23%

I-190 Leominster North of Route 117		
Year	Volume	Growth
2018	51,923	2%
2016	50,736	6%
2015	47,892	7%
2013	44,399	0%
2012	44,239	1%
2011	43,774	-1%
2010	44,293	1%
2009	43,792	3%
2008	42,272	7%
2007	39,149	-6%
2006	41,503	1%
2005	41,154	0%
2004	41,168	4%
2003	39,579	0%
2002	39,700	8%
2001	36,548	
Growth since 2015:		8%

I-190 Sterling North of Route 12		
Year	Volume	Growth
2018	39,013	2%
2016	38,121	0%
2015	37,931	4%
2014	36,505	6%
2013	34,322	-1%
2012	34,819	8%
2011	32,080	3%
2010	31,131	-12%
2009	34,735	7%
2008	32,180	-1%
2007	32,612	-2%
2006	33,168	2%
2005	32,646	-9%
2004	35,700	22%
2003	28,000	0%
2002	28,000	10%
2001	25,100	
Growth since 2015:		3%

I-190 Sterling North of Route 140			I-190 Sterling South of Route 140			12 Sterling North of I-190		
Year	Volume	Growth	Year	Volume	Growth	Year	Volume	Growth
2018	37,374	6%	2018	39,961	23%	2018	9,193	5%
2016	34,959	2%	2016	30,844	0%	2016	8,709	1%
2015	34,322	7%	2015	30,691	-8%	2015	8,629	-1%
2014	31,828	4%	2014	33,143	2%	2014	8,712	-14%
2013	30,586	-1%	2013	32,625	-1%	2013	9,946	12%
2012	30,764	0%	2012	33,058	1%	2012	8,763	-17%
2011	30,802	3%	2011	32,629	-1%	2011	10,284	21%
2010	30,003	-3%	2010	33,026	2%	2010	8,137	-3%
2009	31,050	-15%	2009	32,483	3%	2009	8,375	-2%
2008	35,782	17%	2008	31,398	-1%	2008	8,501	1%
2007	29,524	0%	2007	31,653	6%	2007	8,385	0%
2006	29,537	1%	2006	29,722	6%	2006	8,379	-3%
2005	29,290	0%	2005	27,919	-23%	2005	8,625	-4%
2004	29,300	4%	2004	34,300	0%	2004	9,003	0%
2003	28,078	4%	2003	34,200	11%	2003	8,969	4%
2002	26,965	1%	2002	30,600	23%	2002	8,647	-1%
2001	26,800		2001	23,500		2001	8,693	
Growth since 2015:		8%	Growth since 2015:		23%	Growth since 2015:		6%

202 North of Templeton Town-Line		
Year	Volume	Growth
2018	5,130	2%
2016	5,013	6%
2015	4,720	
Growth since 2015:		8%

Progress

The table 4-28 below shows projects with congestion benefits which are scheduled on the 2020-2024 Transportation Improvement Program. As mentioned, some of the most congested roadways have been or will be addressed in the near future. Perhaps most notable in the below list is Route 13 through Leominster, currently listed for major improvements in 2020.

Table 4-28 - 2020-2024 TIP Projects with Congestion Benefits

City/Town	Project	Year	Cost
Leominster	LEOMINSTER- RECONSTRUCTION ON ROUTE 13, FROM HAWES STREET TO PROSPECT STREET	2020	$5,994,626
Lancaster	LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	2021	$2,723,583
Fitchburg	FITCHBURG- BRIDGE REPLACEMENT AND RELATED WORK, F-04-017, WATER STREET (STATE 2A) OVER BOULDER DRIVE AND PANAM RAILROAD & F-04-018, WATER STREET (ROUTE 12) OVER NORTH NASHUA RIVER	2021	$21,543,216
Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	2022	$9,537,724
Sterling- West Boylston	STERLING- WEST BOYLSTON- IMPROVEMENTS ON ROUTE 140 AT I-190	2023	$834,840
Templeton	TEMPLETON- ROUNDABOUT CONSTRUCTION AT THE INTERSECTION OF PATRIOTS ROAD, SOUTH MAIN STREET, NORTH MAIN STREET AND GARDNER ROAD	2023	$2,495,018
Lancaster	LANCASTER- INTERCHANGE IMPROVEMENTS AT ROUTE 2 EXIT 34 (OLD UNION TURNPIKE)	2024	$5,568,000
Leominster	LEOMINSTER- IMPROVEMENTS AT ROUTE 12 (NORTH MAIN STREET) AT HAMILTON STREET; ROUTE 12 (NORTH MAIN STREET) AT NELSON STREET	2024	$5,145,920

Trends

Traffic

Counts throughout the region show a period of increased traffic. Along with increased traffic comes heavier and more frequent periods of congestion. Many of the highlighted areas in this section have shown congestion for many years, especially during rush hour. Trends indicate that these areas, along with others, will continue to face problems with congestion as they currently exist.

Recommendations

It is important to prepare for increased traffic and congestion throughout the region. Investments must be well thought out and balanced with other needs such as investments in maintenance and expansion. The following recommendations are made to help prevent the spread of congestion in the region.

- Continue to monitor trends throughout the region.

- Continue to monitor emerging technologies such as autonomous vehicles and ride hailing services and the impact made on congestion throughout the region.
- Continue to profile areas of heavy congestion and make recommendations for improvements.
- Work with MART and the MBTA to increase ridership in modes other than automobiles.

CONGESTION

Congestion occurs at intersections and along road segments throughout the region which adversely impact commuter travel, the efficient movement of goods and air quality. The following areas of congestion were identified through local knowledge, public input from surveys, MRPC studies, identified bottlenecks and various technical data sources.

Congested Corridors

Congestion in the following corridors/locations tends to create the greatest impacts to traffic flow in the region. Inadequate geometrics, right-of-way issues and improper signal timings and/or phases result in poor vehicle flows and, in many cases, unsafe conditions. Concerns will range from local intersections and corridors to congestion on regionally important highways such as Route 2.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner – This highway serves as the second major east-west connector for the Commonwealth and has a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters. Regular resurfacing and maintenance costs are significant in terms of dollars and are usually well beyond the limited federal funds allocated to the Region. There is still a need for an increased investment to maintain Route 2, along with all roadways in the region, in an acceptable condition. The possibility of the section of Route 2 between I-495 and I-190 being incorporated into the interstate system due to its natural connection between these two major routes has been discussed. Designation of this type, i.e. interstate highway, would make this segment eligible for Interstate Maintenance funds. Connections to nearly all major routes in the region exist on Route 2, as does the interchange of Route 2 and I-190. Recent improvements to the pavement striping in this

location seem to have reduced confusion and congestion, although further study is needed.

- Route 12, Fitchburg and Leominster – This main corridor through the cities of Fitchburg and Leominster may be the most congested in the region. Many improvement projects have been completed in recent years to address congestion issues. Most notably were major signal and lane improvements between Bemis Road in Fitchburg and Erdman Way in Leominster completed in 2010. Adequate access to Route 2 often dominates local concerns. The City of Fitchburg continues to maintain the need for improved access between Route 2 and its downtown as a major force in the communities' economic development; this would also serve as a congestion mitigation measure for traffic on surrounding streets and intersections leading into the city from the highway. This concern is echoed by the North Central Massachusetts Chamber of Commerce as one of the major needs for the area as well as the city. Major issues also remain in both downtown areas of Fitchburg and Leominster especially during peak hours. An MRPC study, "*Downton Fitchburg Bottleneck Profile*" (2012), ultimately determined that major signal improvements were needed in that area.

- Route 13 Leominster– This segment was well documented in the 1999 MassDOT Study "Fitchburg/Leominster/Lunenburg Transportation Analysis Project". Although many improvements have been made in the last 20 years this corridor still remains among the regions most congested. Several recommendations were proposed to address congestion as well as safety issues associated with heavy traffic volumes and the poor geometrics of the Route 13/Haws Street/Route 2 interchange. In 2008 the Route 13 Bridge over the North Nashua River was rehabilitated and pedestrian safety improvements were made. In 2010 MassDOT introduced design plans for Route 13 in Leominster between Prospect and Haws Streets, the most congested area of Route 13, which involves a new signal at Route 13 and Mead, as well as signal equipment upgrades and coordination of existing signals. Many amendments to this project have been made since the original concept.

The 2020-2014 Transportation Improvement Program lists this project as being funded in 2020.

- South Street/Merriam Avenue, Fitchburg and Leominster – This corridor serves as one of two major connecting roads between Fitchburg and Leominster in addition to providing direct access to Route 2. Volumes along this corridor are mainly affected by a traffic signal at the Route 2 westbound ramp/Twin City Mall entrance crossing as well as by the Merriam Avenue Bridge over Route 2. Road widths are limited by the bridge and abutting land uses to two travel lanes; one northbound and one southbound. In 2018 MRPC completed the Merriam Avenue – South Street Corridor Bottleneck Study which profiled this area and made recommendations to improve congestion.

- Route 117, Lancaster and Leominster – This state route is a major commuter road that provides access to I-190 at the Leominster/Lancaster line and I-495 in Bolton located east of Lancaster. Most of the congestion along this corridor occurs during AM and PM peak hours. Also causing significant delays is an at-grade freight railroad crossing east of Route 70 in Lancaster which frequently stalls traffic for long periods of time as trains pass through. Within the past 20 years there has been major commercial development on both sides of Route 117 on the Leominster/Lancaster line. These commercial developments have been complemented by various improvements to the roadway including the addition of turning lanes and stop lights allowing easier access to both I-190 and the commercial access roads. MRPC conducted the "Route 117 Corridor Profile" (2014) through the town of Lancaster which suggested major improvements to the intersections of Route 117/Lunenburg Road and Route 117/Main Street. Improvements are scheduled to occur in year 2021 of the 2020-2024 Transportation Improvement Program.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner – Commuter traffic on Route 2 has grown throughout the Montachusett Region. This highway serves as the second major east-west connector for the Commonwealth and has

a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters.

- Downtown Gardner – Route 101 (Central Street/Parker Street) runs east-west through this corridor while Route 68 (Main Street/Parker Street) runs north-south. The layout of this intersection can be confusing to drivers and is a high crash location in the region. Furthermore, traffic routinely backs up through downtown during peak hours. While many variations of geometrics have been tried over the years Right of Way issues make it difficult to make an ideal improvement. Long term efforts may need to involve complete reconstruction and reconfiguration of this intersection.

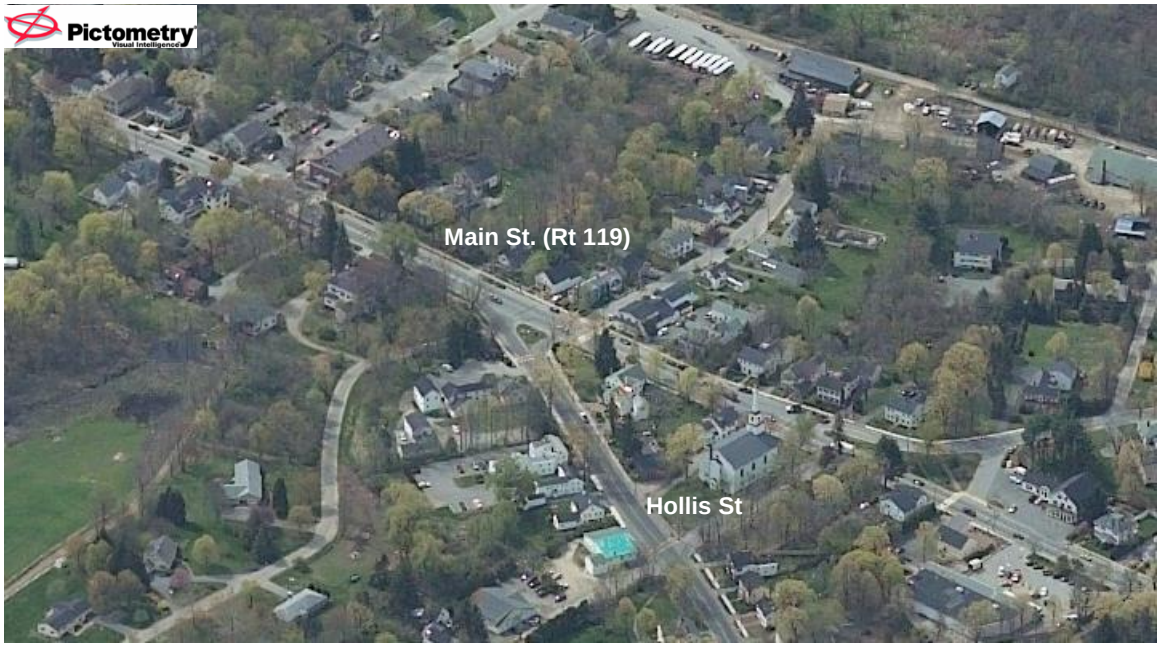
Figure 4-48 - Main Street (Route 68)/Central Street (Route 101) in Gardner Looking North.

- Route 119, Townsend and Groton – This road has become a major commuting route for the northern portion of the Region. Route 119 runs southeast from New Hampshire to I-495 in Littleton to Route 2 at the Concord Rotary. Peak hour flows are heaviest eastbound

in the AM and reversed in the PM reflecting its use as a commuting road to the I-495/Boston area. The route runs through the town centers of Townsend and Groton and as such greatly impacts local travel patterns.

Figure 4-49 – Route 119 in Townsend Looking North

Figure 4-50 – Route 119 in Groton Looking South



- Route 2A, Ayer - from Park Street (Routes 2A/111) to the Littleton town line, includes Main Street, East Main Street, and Littleton Road. Peak hour traffic suffers from slow travel speeds along the Main Street segment through the downtown area due to side street traffic, on-street parking, an MBTA Commuter Rail stop downtown and narrow lanes. A notable intersection in this corridor is Park Street (Routes 2A/111) and Main Street. Park Street traffic looking to continue onto Route 2A east/111 south must stop and wait for a gap in traffic on East Main Street/Main Street which results in long peak hour delays from this approach.

Figure 4-51 - Main Street (Routes 2A/111) in Ayer from Park Street to Columbia Street Looking North

System Analysis

Transportation Studies with Congestion Elements

Member communities regularly request various types of transportation studies which the MRPC conducts through the Unified Planning Work Program (UPWP). Many of these studies involve

examining congestion issues along a roadway or corridor. One of the most useful data sets pertaining to congestion issues is travel time. Travel time data is collected using a GPS Device and TravTime 2.0™, a software program which measures travel time and delays on a roadway. Since MRPC has acquired TravTime software, it has regularly been included in analysis in transportation studies done throughout the region. Numerous travel time runs are taken through the study area. From this, an average travel time can be computed during the peak hour through a particular road or corridor. This data is compared to free flow travel time to depict a travel time index rating. The free-flow travel time is the amount of time in seconds it takes to travel a particular corridor at the posted speed limit without any delay. The travel time index (TTI) is a ratio between the average peak hour travel time and free-flow travel time. For example, a TTI value of 1.30 indicates that the average travel time at peak hour takes 30 percent longer than free flow travel time. The table below shows the different congestion levels of the TTI of an arterial roadway.

Table 4-27 - Travel Time Index (TTI) Levels of Congestion

Functional Class	No/Low Congestion	Moderate Congestion	High Congestion	Severe Congestion
Arterials	< 1.5	1.5 - 2.0	2.0 - 2.6	> 2.6

*Source: Federal Highway Administration

Three recent studies which included travel time analysis have been completed in recent years. Below are descriptions of each of these study areas and results from our Travel Time analysis.

Downtown Fitchburg Bottleneck Profile (2012)

The *Downtown Fitchburg Bottleneck Profile* was an effort to highlight various issues causing one of the most significant bottlenecks in the Montachusett Region – Downtown Fitchburg. Throughout the program year various data was collected and analyzed to draw attention to issues leading to traffic delays in the area.

Study Area

The study area encompasses the downtown area from Moran Square at the intersection of Main (Rte. 2A), Lunenburg (Rte. 2A) and Summer Streets in the east extending west to the area known as the "Upper Common" at the intersection of Main, River (Rte. 31) and Mechanic (Rte. 31) Streets. Traffic along the roadways of Main Street and Boulder Drive, including the intersections with other side streets were considered for this report.

Travel Time

	Run 1	Run 2	Run 3	Run 4	Run 5	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	3.73	3.63	3.73	3.85	3.45	3.08	**1.40**
Westbound (Minutes)	5.7	5.83	4.35	3.95	6.03	5.17	**2.18**
Posted Speed Limit = 25 MPH		Corridor Distance (Miles) = 0.99 WB / 0.92 EB			Free Flow Travel Time (Minutes) = 2.38 WB / 2.21 EB		

From the travel time results it is clear that traveling westbound on Main Street during peak hour entails dealing with a high level of congestion. A major inhibitor of traffic flow through downtown was the lack of a system of properly operating and coordinated network of traffic signals.

Figure 4-52 - Main Street in Fitchburg Looking North

Route 117 Corridor Profile (2014)

The Town of Lancaster requested the Montachusett Regional Planning Commission (MRPC) to conduct a study of Route 117 through the community in the spring of 2013. In its efforts the MRPC in turn has engaged town officials to form an informal Steering Committee to assist, offer guidance and provide local knowledge that would contribute to a Corridor Profile along the road. The goal was to assess the conditions and problems that may exist along Route 117 and offer recommendations and avenues to make improvements where necessary. After much data collection, analysis, site visits and public engagement the MRPC completed the ***Route 117 Lancaster Corridor Profile*** in 2014. As part of the report, multiple Travel Time runs were taken during the measured peak hour times through the entire 4.7 miles of Route 117 in Lancaster.

Travel Time

	Run 1	Run 2	Run 3	Average Time	Travel Time Index (TTI)
Eastbound (Minutes)	8.68	8.33	8.93	8.65	**1.15**
Westbound (Minutes)	8.3	8.47	11.95	9.57	**1.28**
Posted Speed Limit = 40 MPH		Corridor Distance (Miles) = 5.0 Miles		Free Flow Travel Time (Minutes) = 7.5 WB / 7.5 EB	

Although congestion did not pose a great issue through the corridor as a whole, the junction of Route 117 and Route 70 and its two major intersections were identified as having long delays for the Route 70 approaches. Improvement alternatives were presented to the town and a project at this location is listed in year 2021 of the 2020-2024 Transportation Improvement Program.

Figure 4-53 - Lancaster Route 117/70 looking North

Merriam Avenue – South Street Corridor Bottleneck Study (2018)

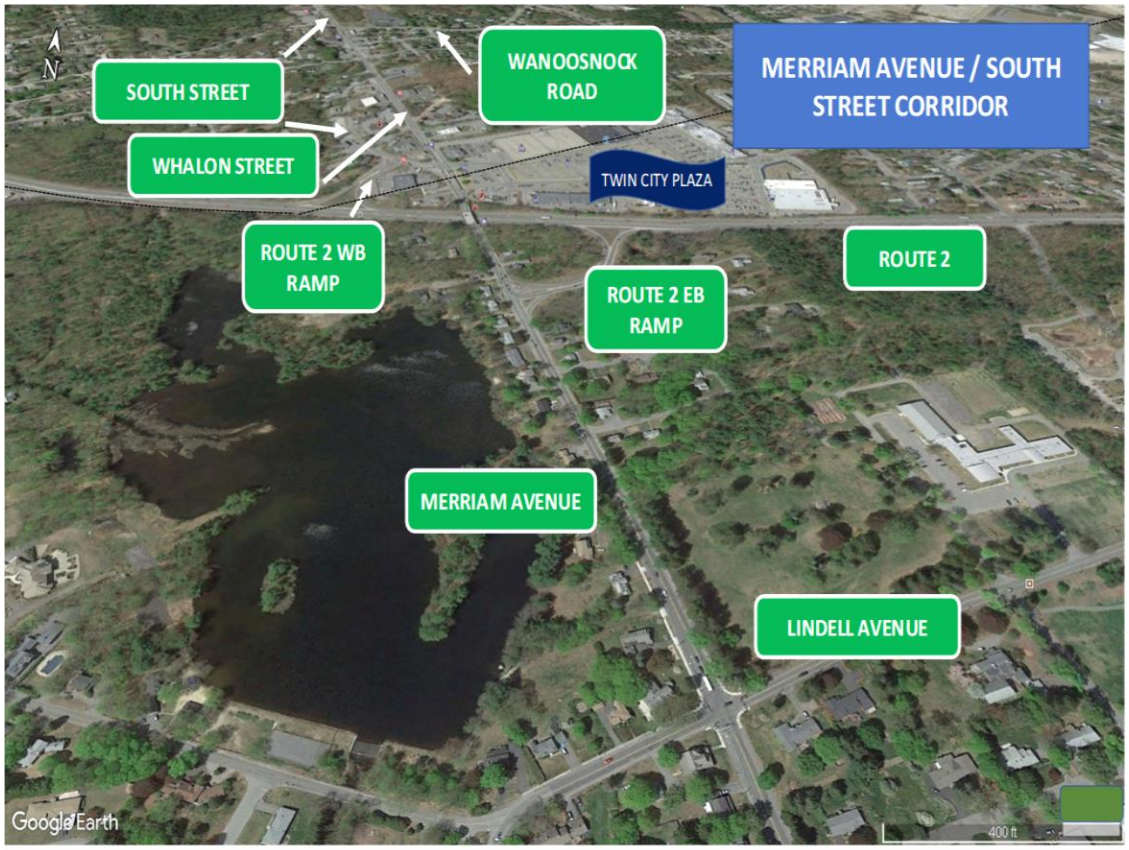
The Merriam Avenue - South Street Bottleneck study stems from a goal set in the 2016 RTP of the to “reduce congestion and improve mobility”. One performance measure set under this goal was to “identify one (1) bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures”. This section of Merriam Avenue and South Street in the cities of Leominster and Fitchburg has long been considered one of the regions congested corridors and is considered a traffic “bottleneck”. The Federal Highway Administration’s (FHWA) definition of a traffic bottleneck is "a localized section of highway that experiences reduced speeds and inherent delays due to a recurring operational influence or a nonrecurring impacting event." This study profiles existing conditions and identifies factors adding to the congestion of the Merriam Avenue - South Street corridor.

Study Area

The study area extends from the south at the intersection of Merriam Avenue and Lindell Avenue in Leominster, to the north at the intersection of South Street and Wanoosnoc road in Fitchburg. The Merriam Avenue - South Street corridor serves as one of two major connecting roads between the cities of Fitchburg and Leominster in addition to providing direct access to Route 2. Contained within this corridor are the following primary locations, listed from south to north, which are the main catalysts for congestion and are highlighted in this study.

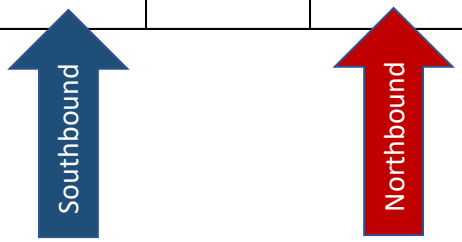
- Intersection of Merriam Ave./ Route 2 East ramp
- Merriam Ave. bridge over Route 2
- Signalized Intersection of Merriam Ave./ South St./ Whalon St./ Twin City Plaza
- Signalized Intersection of South St./ Wanoosnoc Rd.

Figure 4-54 - Leominster/Fitchburg, Merriam Ave/South Street Corridor



Travel Time

Functional Class	No/Low Congestion	Moderate Congestion	High Congestion	Severe Congestion
Arterials	< 1.5	1.5 - 2.0	2.0 - 2.6	> 2.6



Southbound Traffic through the study area measures no or low congestion (TTI of 1.34). Northbound traffic experienced high congestion (TTI of 2.51). The study also considered delay caused by the intersections along the corridor and physical challenges along the road such as the road being limited to two lanes over the route 2 bridge. A number of improvement alternatives were presented in the study.

Continuous Count Stations in Region

The following tables list average daily traffic volumes from MassDOT continuous count stations on major routes (Route 2 and I-190) in the Montachusett region going back to 2001. From these tables the following patterns can be seen.

- Counts have recuperated to pre-recession levels after a period of decline throughout the region in the mid 2000's.
- Steady growth has been occurring throughout the region since 2015
- If the trend of traffic growth continues, increased congestion can be expected, especially during rush hour.

Route 2 Littleton East of Harvard Town Line		
Year	Volume	Growth
2018	54,452	2%
2016	53,207	2%
2015	52,262	9%
2014	47,432	2%
2013	46,642	2%
2012	45,692	0%
2011	45,569	-3%
2010	47,100	-3%
2009	48,540	-1%
2008	48,803	0%
2007	48,800	8%
2006	45,112	-2%
2005	46,229	-1%
2004	46,900	-7%
2003	50,022	-1%
2002	50,603	1%
2001	50,000	
Growth since 2015:		4%

Route 2 Lancaster West of Route 70		
Year	Volume	Growth
2018	59,761	7%
2016	55,471	2%
2015	54,277	6%
2013	50,847	1%
2012	50,113	1%
2011	49,476	-3%
2010	51,104	1%
2009	50,435	5%
2008	47,806	1%
2007	47,186	-1%
2006	47,800	6%
2005	45,104	-3%
2004	46,433	2%
2003	45,454	0%
2002	45,457	
Growth since 2015:		9%

Route 2 Westminster East of Route 140		
Year	Volume	Growth
2018	52,062	2%
2016	50,872	4%
2015	48,912	15%
2014	41,401	2%
2013	40,614	2%
2012	39,880	-6%
2011	42,088	-2%
2010	43,000	1%
2009	42,770	-1%
2008	42,999	3%
2007	41,887	-1%
2006	42,172	-2%
2005	42,991	-1%
2004	43,257	3%
2003	42,168	-1%
2002	42,663	4%
2001	40,923	
Growth since 2015:		6%

Route 2 Athol East of Orange TL		
Year	Volume	Growth
2018	14,910	15%
2016	12,699	9%
2015	11,514	5%
2014	10,965	3%
2013	10,615	-2%
2012	10,826	-5%
2011	11,385	1%
2010	11,274	-30%
2009	14,711	27%
2008	10,740	-2%
2007	11,003	-2%
2006	11,202	0%
2005	11,180	0%
2004	11,127	1%
2003	10,967	2%
2002	10,800	4%
2001	10,415	
Growth since 2015:		23%

I-190 Leominster North of Route 117		
Year	Volume	Growth
2018	51,923	2%
2016	50,736	6%
2015	47,892	7%
2013	44,399	0%
2012	44,239	1%
2011	43,774	-1%
2010	44,293	1%
2009	43,792	3%
2008	42,272	7%
2007	39,149	-6%
2006	41,503	1%
2005	41,154	0%
2004	41,168	4%
2003	39,579	0%
2002	39,700	8%
2001	36,548	
Growth since 2015:		8%

I-190 Sterling North of Route 12		
Year	Volume	Growth
2018	39,013	2%
2016	38,121	0%
2015	37,931	4%
2014	36,505	6%
2013	34,322	-1%
2012	34,819	8%
2011	32,080	3%
2010	31,131	-12%
2009	34,735	7%
2008	32,180	-1%
2007	32,612	-2%
2006	33,168	2%
2005	32,646	-9%
2004	35,700	22%
2003	28,000	0%
2002	28,000	10%
2001	25,100	
Growth since 2015:		3%

I-190 Sterling North of Route 140			I-190 Sterling South of Route 140			12 Sterling North of I-190		
Year	Volume	Growth	Year	Volume	Growth	Year	Volume	Growth
2018	37,374	6%	2018	39,961	23%	2018	9,193	5%
2016	34,959	2%	2016	30,844	0%	2016	8,709	1%
2015	34,322	7%	2015	30,691	-8%	2015	8,629	-1%
2014	31,828	4%	2014	33,143	2%	2014	8,712	-14%
2013	30,586	-1%	2013	32,625	-1%	2013	9,946	12%
2012	30,764	0%	2012	33,058	1%	2012	8,763	-17%
2011	30,802	3%	2011	32,629	-1%	2011	10,284	21%
2010	30,003	-3%	2010	33,026	2%	2010	8,137	-3%
2009	31,050	-15%	2009	32,483	3%	2009	8,375	-2%
2008	35,782	17%	2008	31,398	-1%	2008	8,501	1%
2007	29,524	0%	2007	31,653	6%	2007	8,385	0%
2006	29,537	1%	2006	29,722	6%	2006	8,379	-3%
2005	29,290	0%	2005	27,919	-23%	2005	8,625	-4%
2004	29,300	4%	2004	34,300	0%	2004	9,003	0%
2003	28,078	4%	2003	34,200	11%	2003	8,969	4%
2002	26,965	1%	2002	30,600	23%	2002	8,647	-1%
2001	26,800		2001	23,500		2001	8,693	
Growth since 2015:		8%	Growth since 2015:		23%	Growth since 2015:		6%

202 North of Templeton Town-Line		
Year	Volume	Growth
2018	5,130	2%
2016	5,013	6%
2015	4,720	
Growth since 2015:		8%

Progress

The table 4-28 below shows projects with congestion benefits which are scheduled on the 2020-2024 Transportation Improvement Program. As mentioned, some of the most congested roadways have been or will be addressed in the near future. Perhaps most notable in the below list is Route 13 through Leominster, currently listed for major improvements in 2020.

Table 4-28 - 2020-2024 TIP Projects with Congestion Benefits

City/Town	Project	Year	Cost
Leominster	LEOMINSTER- RECONSTRUCTION ON ROUTE 13, FROM HAWES STREET TO PROSPECT STREET	2020	$5,994,626
Lancaster	LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	2021	$2,723,583
Fitchburg	FITCHBURG- BRIDGE REPLACEMENT AND RELATED WORK, F-04-017, WATER STREET (STATE 2A) OVER BOULDER DRIVE AND PANAM RAILROAD & F-04-018, WATER STREET (ROUTE 12) OVER NORTH NASHUA RIVER	2021	$21,543,216
Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	2022	$9,537,724
Sterling- West Boylston	STERLING- WEST BOYLSTON- IMPROVEMENTS ON ROUTE 140 AT I-190	2023	$834,840
Templeton	TEMPLETON- ROUNDABOUT CONSTRUCTION AT THE INTERSECTION OF PATRIOTS ROAD, SOUTH MAIN STREET, NORTH MAIN STREET AND GARDNER ROAD	2023	$2,495,018
Lancaster	LANCASTER- INTERCHANGE IMPROVEMENTS AT ROUTE 2 EXIT 34 (OLD UNION TURNPIKE)	2024	$5,568,000
Leominster	LEOMINSTER- IMPROVEMENTS AT ROUTE 12 (NORTH MAIN STREET) AT HAMILTON STREET; ROUTE 12 (NORTH MAIN STREET) AT NELSON STREET	2024	$5,145,920

Trends

Traffic

Counts throughout the region show a period of increased traffic. Along with increased traffic comes heavier and more frequent periods of congestion. Many of the highlighted areas in this section have shown congestion for many years, especially during rush hour. Trends indicate that these areas, along with others, will continue to face problems with congestion as they currently exist.

Recommendations

It is important to prepare for increased traffic and congestion throughout the region. Investments must be well thought out and balanced with other needs such as investments in maintenance and expansion. The following recommendations are made to help prevent the spread of congestion in the region.

- Continue to monitor trends throughout the region.

- Continue to monitor emerging technologies such as autonomous vehicles and ride hailing services and the impact made on congestion throughout the region.
- Continue to profile areas of heavy congestion and make recommendations for improvements.
- Work with MART and the MBTA to increase ridership in modes other than automobiles.

TRANSIT

Transit is an important mode of transportation in the Montachusett region. Transit provides access to essential services such as jobs, grocery stores, medical facilities, schools and social services, in addition to recreational transportation. In order to encourage people to switch from driving to riding, a transit system must be efficient and effective, convenient and safe.

Montachusett Regional Transit Authority (MART) provides a variety of transportation services for residents of the Montachusett Region and other areas throughout the Commonwealth. The communities served by MART have grown steadily over the years. MART now serves 22 communities in and out of the MRPC region: Fitchburg, Leominster, Gardner, Ashburnham, Shirley, Ayer, Lancaster, Sterling, Hubbardston, Royalston, Littleton, Winchendon, Ashby, Templeton, Westminster, Hardwick, Lunenburg, Harvard, Bolton, Boxborough, Stow and Athol. Fixed route bus services, paratransit and subscription services are operated by a private management company, namely, Management of Transportation Services, Inc. All other transportation is operated by a variety of private vendors in Massachusetts. The Massachusetts Bay Transportation Authority (MBTA) is responsible for commuter rail services from Fitchburg to Boston.

Transit Equity

The Montachusett Regional Transit Authority (MART) operates the fixed route transit system in the region. Fixed route service is concentrated within the urban cities of Fitchburg, Leominster and Gardner. Over the years, service has expanded slowly into neighboring communities based upon need, local requests and area attractions. MART has been striving to accomplish many of the goals that were set established in the 2015 RTP.

Additionally, on a regular basis, the MRPC conducts Transit Development Plan (TDP) for the fixed route communities that involve a review of demographics, attractions and local

public outreach to identify issues and needs for the system. From these studies, adjustments are made to better serve the population.

In September 2018, the Montachusett MPO endorsed a "Coordinated Public Transit–Human Services Transportation Plan (CPT-HST)" update that documents the region's unmet human-service transportation needs of individuals with disabilities, low-income individuals (or persons below the poverty level) and the elderly. The target populations for the CPT-HST align with the Title VI and EJ target populations.

The CPT-HST Plan was developed as a tool to help local transportation providers and communities improve transportation services, increase efficiency of service delivery, and expand outreach to meet growing needs. It also seeks to provide a framework to guide the investment of existing transportation resources and the acquisition of future funds. A series of priorities and recommendations are included in the CPT-HST Update to address transit equity issues and are incorporated in this RTP within the Transit chapter.

Improvements Made Since 2015

MART has been striving to accomplish many of the goals that were set established in the 2015 RTP.

- MART, as a result of the Comprehensive Service Analysis, revised its bus schedules for all local routes in Fitchburg/Leominster and Gardner effective in September 2015.
- Route 11 was re-routed to the new Great Wolf Lodge resort in Fitchburg to accommodate the workforce of that business.
- In order to ensure continued service levels a fare increase was implemented in July 2015. MART had not previously increased fares in eight years. Due to the increasing demand and lack of increase in Commonwealth funding, this fare increase was an important part of the overall financing of MART. This may have had a negative impact on ridership, although downward ridership is being experienced all over the country.
- Brokerage services continue to increase in volume every year. Services have grown from $105 million in 2014 to $160 million in 2018.

- MART received a TIGGER II grant in 2011 to implement projects to reduce its carbon footprint. With this grant MART has made several improvements to its facilities resulting in substantial energy savings overall. MART has:
    i. Built two Solar PV systems at its Water Street facility in Fitchburg and the Maintenance Facility in Gardner
    ii. Replaced all lighting in all facilities with LEDs
    iii. Replaced its HVAC systems with new high efficiency systems in its Water Street and Main Street facilities,
    iv. Installed a BackNet Energy Management system in all its facilities
    v. Installed Thermal Destratification Fans in all its vehicle storage facilities.
- Wachusett Station was completed and opened for commuter rail and commuter shuttle service on September 30, 2016. The Wachusett Shuttle runs from Gardner City Hall in a 20-minute one-way run from 5:15am to 7:40pm with break intervals throughout the day. The service times are meant to coincide with train arrival and departure times.
- MART added three new fixed route shuttles since the last RTP:
    i. Wachusett Shuttle began on 9/30/2016 to coincide with the opening of Wachusett Station.
    ii. On April 24, 2017 MART began a pilot project to provide service between Fitchburg/ Leominster and the Devens Enterprise Zone. The service was designed by a public-private collaborative between MART, the Devens Enterprise Commission, Mass Development, and private companies with businesses located in the Devens Zone. The shuttle brings workers from Fitchburg and Leominster to stops in Shirley, throughout Devens, and Ayer. The service was made into a normal route in October 2017.
    iii. On June 4, 2018 MART began a “last mile” commuter rail shuttle service. This shuttle travels between the MBTA Littleton Commuter Rail Station and goes along Route 110 in Littleton and Westford out to the Westford Technology Park (Juniper Networks). The service

only runs at AM peak and PM peak commuting hours and is designed to meet the commuters coming off and going to the Littleton commuter train station.

Fixed Route

Local - Fitchburg/Leominster and Gardner

Local fixed route bus services operate along set routes and follows a set schedule Monday through Saturday. Twelve (12) routes are available in Fitchburg, Leominster and Gardner. There is also a supplemental route to Lunenburg in the afternoon. Buses also run more frequently (15 minutes) to and from Fitchburg State University during the campus school year on weekdays. Bus services are not offered on Sundays and holidays. Regional frequencies vary depending on the route

Table 4-29: Fixed Routes Yearly Ridership

Fixed Routes	2015	2016	2017	2018	Percent Change 2015 to 2018
Leominster/Fitchburg	605,952	591,374	496,005	470,744	-22.31%
Gardner	57,193	58,852	47,548	45,848	-19.84%

Source: Montachusett Regional Transit Authority

As Table 4-29 shows, MART's fixed-route bus ridership decreased over the 4-year period from FYs 2015-2018. The biggest single decline is from 2016 to 2017 with at 16% drop in Leominster/Fitchburg ridership and a 19% drop in Gardner ridership. Ridership data from 2018 seems to indicate that the decline has leveled off between FY 2017 and 2018, with a 5.09% drop in Leominster/Fitchburg ridership and a 3.58% drop in Gardner ridership.

Regional Services

MART has a number of regional fixed route bus and shuttle services that span a wide geographic area. Most of the services are new and don't cover the entire 4 years of the 2015 RTP.

The Link Bus service is available along the Route 2/2A between Greenfield and Gardner, stopping in Gardner, Templeton, Phillipston, and Athol. The Athol Link connects to Route

32 operated by the Franklin Regional Transit Authority (FRTA). MART also operates the Winchendon Link which travels along state routes 68 & 202 from Gardner through Baldwinville and into Winchendon Center.

Table 4-30: Link Yearly Ridership

Link Route	2015	2016	2017	2018	Percent Change 2015 to 2018
Athol Link	31,238	19,559*	13,883	10,694	**
Athol-Orange Shuttle	N/A	10,318	18,124	22,043	**
Winchendon Link	5,760	6,022	5,388	5,158	-10.45%

Source: Montachusett Regional Transit Authority

*The dramatic drop in ridership on the Athol/Orange link between 2015 and 2016 was due to a change in services. In FY16 the Athol-Orange Fixed Route Shuttle began (November 2015). This service replaced an old Dial-A-Ride service and instituted a local fixed route between Athol and Orange. Therefore, the ridership was not truly lost, just diverted to a different route.

Combining Athol Link ridership with the Athol-Orange Shuttle ridership shows an increase of almost 5%. The Winchendon Link continues to have its ups and downs; peaking in FY16 at 6,022 riders and bottoming out at 5,158 in FY18.

The Intercity Bus Route travels within Gardner, then through Westminster (began in 2016), then to Fitchburg and Leominster. This route has always run from around Labor Day up to Memorial Day.

Table 4-31: Intercity Yearly Ridership

Intercity Routes	2015	2016	2017	2018	Percent Change 2015 to 2018
Intercity Bus	18,409	16,690	10,383*	7,608	-58.67%!
Wachusett Shuttle	N/A	N/A	2,284	4,284	**

Source: Montachusett Regional Transit Authority

* This figure includes the Commuter Bus runs through May, and excludes the riders diverted to the new Wachusett Shuttle.
! 58% decrease includes the Wachusett Shuttle riders.

The Wachusett Shuttle, which began service in on September 30, 2016 (FY 2017), has had an 87.57% increase in ridership due to the opening of Wachusett Station. (Also includes riders served by MART brought between MBTA stations due to track construction in some months.) This new route diverted some of the riders from the

Intercity Bus who rode to access the downtown Fitchburg Commuter Rail Station. This shuttle is a shorter route and more runs with direct access between Gardner City Hall and Wachusett Station.

In FY2017 MART, through a public-private partnership with the Devens Enterprise Commission, launched a new regional shuttle to provide the commuters from Fitchburg and Leominster with access to jobs in Devens, with stops in the local communities of Shirley and Ayer including the Commuter Rail Stations there to provide the last mile connection. It began slowly but was able to achieve measurable ridership in only ten weeks. It continued to grow in 2018 with a peak ridership of 508 in the month of March 2018.

In June 2018, in collaboration with the towns of Littleton and Westford, MART launched the Littleton-Westford Commuter Rail Shuttle, which provide last mile access from the Littleton/495 MBTA Commuter Rail Station to the many business and technology companies along Route 110 in Littleton and Westford. The first month of ridership had an outstanding 250 for only 4 hours of service a day, Monday through Friday. The following table (Table 4-32) displays the ridership for these routes.

Table 4-32: Other Regional Shuttle Yearly Ridership

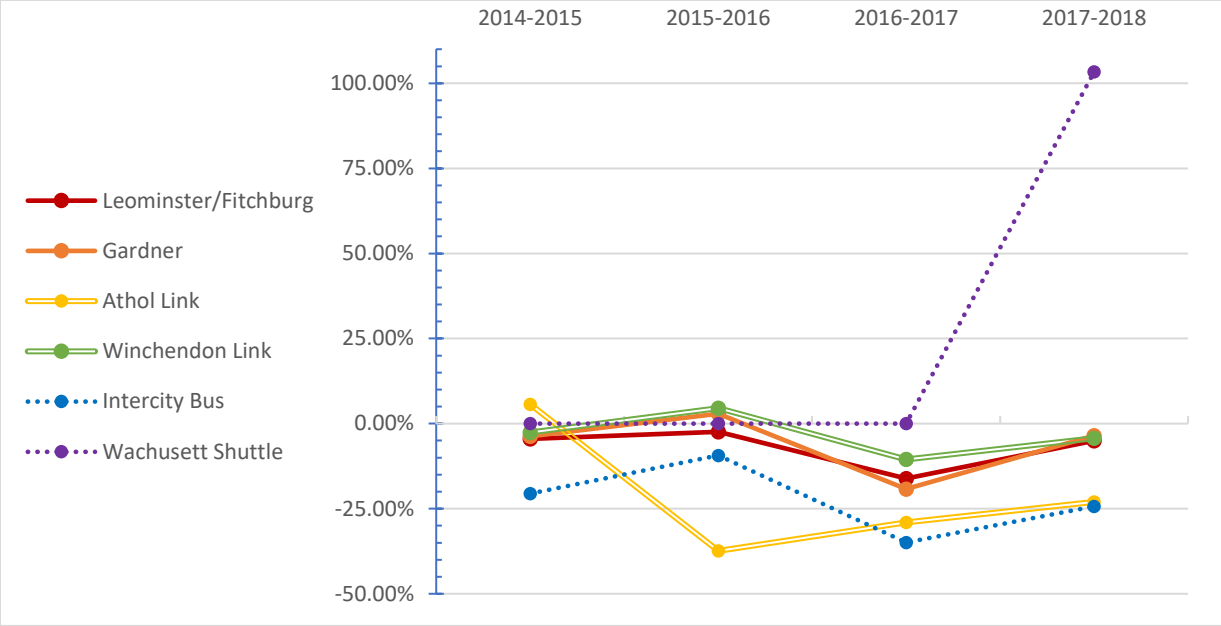
Intercity Routes	2015	2016	2017	2018	Percent Change 2015 to 2018
Devens Regional	--	--	416*	4701	**
Littleton-Westford Commuter	--	--	--	250†	**

Source: Montachusett Regional Transit Authority

* Started as a pilot in late April 2017. Launched at full-time route in October 2017.
† Launched on June 4, 2018. Only 1 month of ridership.

The following figure (Figure 4-55) displays the percent change in ridership from each fiscal year. The Devens Shuttle and Littleton-Westford Commuter Shuttles are **not included** due to the lack of data to accurately calculate percent change in service.

Figure 4-55: Change in Yearly Ridership, Fixed Routes



Source: Montachusett Regional Transit Authority

While ridership on fixed routes (excluding the Wachusett Shuttle) has continued to decrease, the change from FY2017 to FY2018 seems to show the decrease slowing, from an overall decrease of -21.96% between FY2016 and FY2017 to -12.04% between FY2017 and FY2018.

Paratransit

MART has a fleet of 165 vans and small buses for paratransit service. MART's complementary paratransit service includes origin to destination transportation for citizens with disabilities who are eligible under the criteria of the Americans with Disabilities Act (ADA). In other communities in the region, twenty-one (21) member Councils on Aging (COA) provide service for seniors and the disabled; Royalston does not have MART affiliated COA transportation available. Prices and times of operation vary per community.

Table 4-33: Paratransit Yearly Ridership (not including COA)

Communities	2015	2016	2017	2018	Percent Change 2015-2018
Leominster/Fitchburg	93,655	74,095	68,606	71,565	-23.59%
Gardner	18,707	15,341†	16,367	18,837	0.69%
Athol	51,081	17,760‡	1,485	1,470	**
Dial-A-MART Services*	155,958	158,758	155,627	146,166	-6.28%

Source: Montachusett Regional Transit Authority

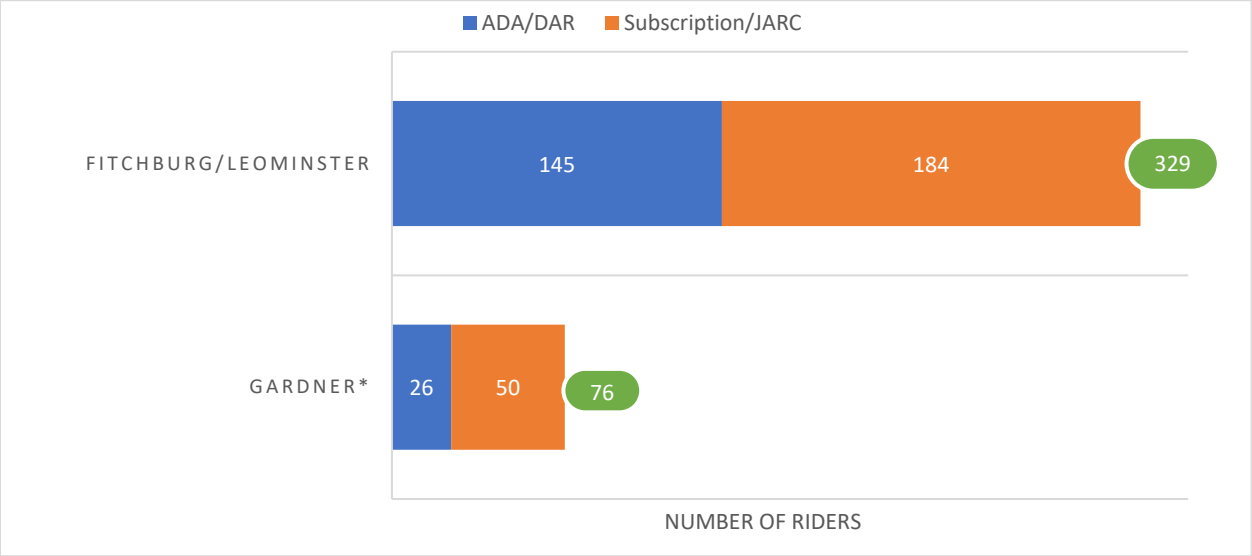
* Includes traditional Dial-A-MART for social service agencies such as GVNA & 7 Hills, as well as HST services such as MassHealth rides and routes for DDS. DDS routes account for 65% of the rides.
† Westminster ADA new service added.
‡Athol services changed from full scale Dial-A-Ride to breakout into Athol ADA, Athol COA & Athol Fixed Route shuttle beginning in November 2015. This number reflects 4 months of full Dial-A-Ride and 8 months of Athol ADA only. About 40% of the ridership was diverted to the fixed route shuttle in the first year. FY17 reflects a full year of Athol ADA Only. Athol COA ridership is about 10% of the original Dial-A-Ride (~5100 rides per year). The percentage change from FY 2017 to FY 2018 is a decrease of 1.01%.

Table 4-34: COA Yearly Ridership

Communities	2015	2016	2017	2018	Percent Change 2015-2018
All COA Service	116,756	117,084	111,100	107,830	-7.65%

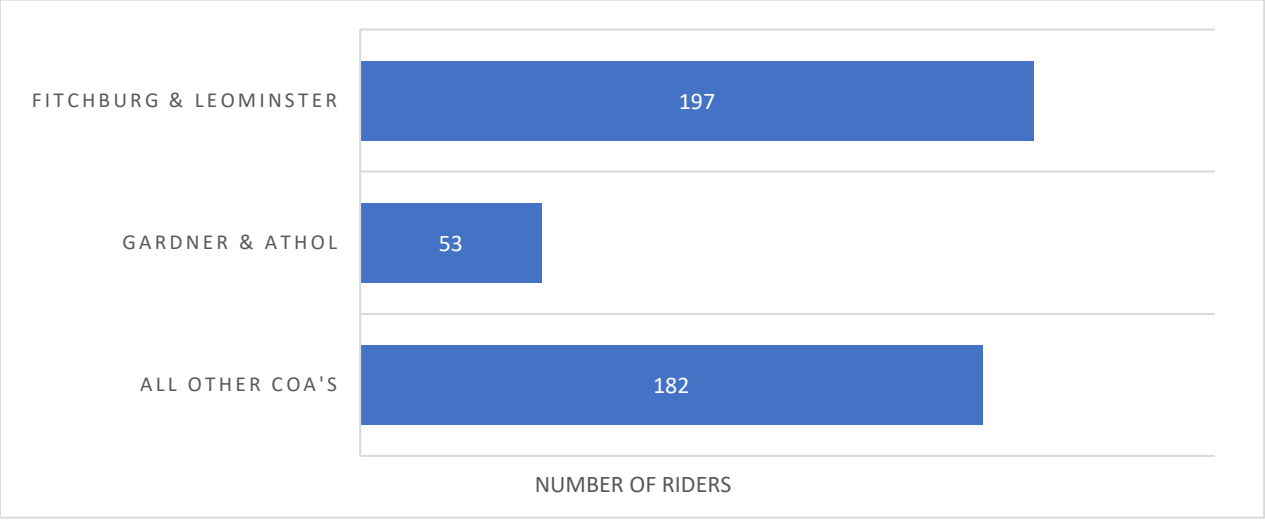
During 2015, paratransit and COA ridership peaked, but since then has seen a gradual decline. The following charts (Figures 4-56 and 4-57) highlight average daily paratransit (not including contracted social service agency rides) and COA ridership across different services and communities.

Figure 4-56: Paratransit Average Daily Ridership (2018)



Source: Montachusett Regional Transit Authority

Figure 4-57: Council on Aging Average Daily Ridership (2018)



Source: Montachusett Regional Transit Authority

Dial-A-MART

Dial-A-MART service is transportation that serves the needs of either human service agencies or targeted populations (elderly, individuals with disabilities, and/or low-income

individuals) through eligible agency sponsored trips. Service is provided on a negotiated cost basis with the agencies. MART utilizes the Dial-A-Mart Services to allow its operating company to act as a private vendor to the Brokerage Services Division of MART. This allows for cost savings to the brokerage program and increased revenue to support paratransit operations.

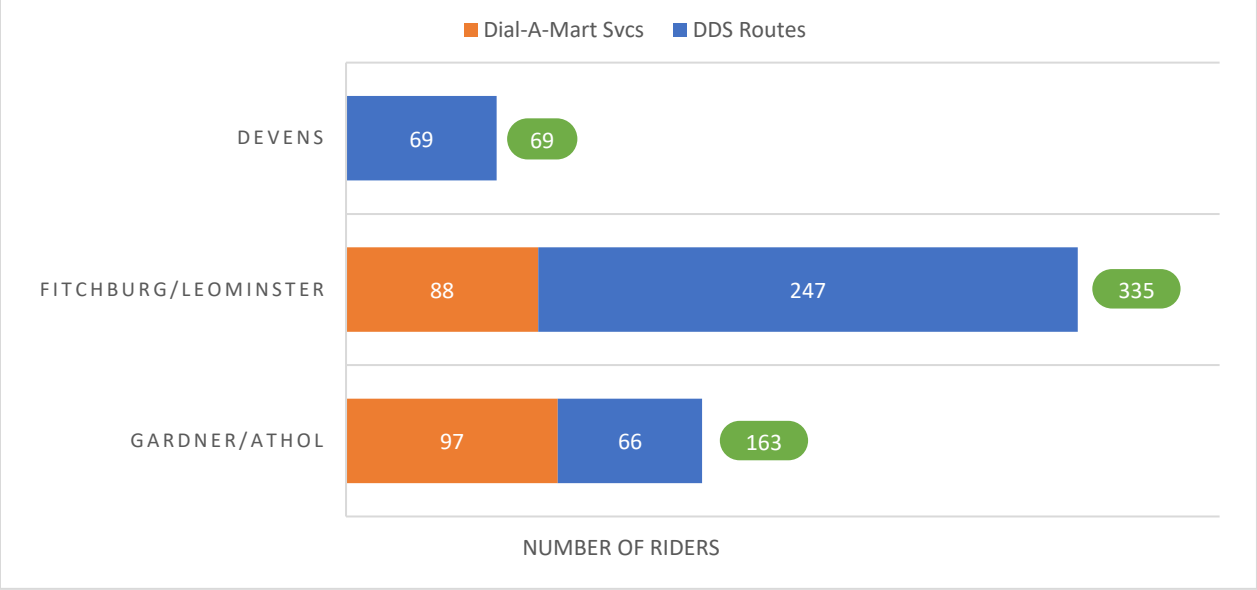
The following chart (Figure 5-58) highlights average daily ridership figures for the Dial-A-Mart services and the Department of Developmental Services (DDS) routes brokered by MART. Overall, average daily ridership has decreased by approximately 2%. However, ridership fluctuates each year, as can be seen in Table 4-35.

Table 4-35: Dial-A-MART Yearly Ridership

Communities	2015	2016	2017	2018	Percent Change 2015 to 2018
Dial-A-MART Services*	155,958	158,758	155,627	146,166	-6.28%

Source: Montachusett Regional Transit Authority

Figure 4-58: Average Daily Ridership for Sponsored Paratransit Services (2018)



Source: Montachusett Regional Transit Authority

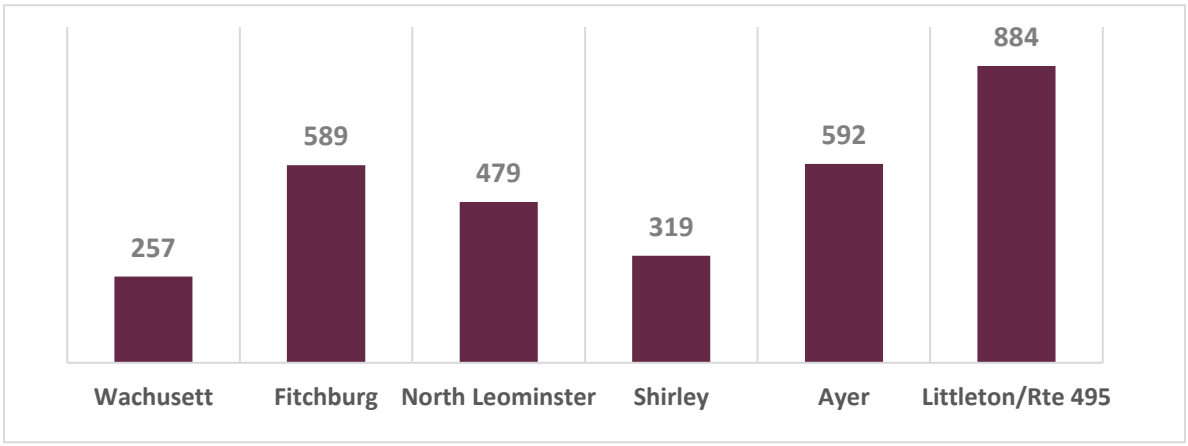
Commuter Train Stations and Parking Facilities

Commuter rail service is managed by the Massachusetts Bay Transportation Authority (MBTA). In September 2016, MBTA extended service 4.5 miles of the Fitchburg Line with the opening of the Wachusett Station in Fitchburg. MART provides a transit shuttle from Gardner to Wachusett Station. The service operates from Wachusett to Boston, with stops in Fitchburg, Leominster, Shirley, Ayer and Littleton.

The MBTA audit reports that of the north-side commuter rail lines, the Fitchburg line has experienced the largest real increase and percentage increase for riders. Since 2012, two inbound trains and two outbound trains were added to increase service.

The daily ridership for the commuter line can be seen in Figure 4-59, with a large number of riders boarding and alighting at the Littleton stop. Notably, the Littleton stop's parking facilities recently added parking for an additional 50 vehicles, but is still often at capacity daily, with some drivers parking illegally. Current parking capacity and potential additions are presented in Table 4-36.

Figure 4-59: Commuter Rail Average Daily Ridership



Source: Massachusetts Bay Transit Authority and Central Transportation Planning Staff

Table 4-36: Commuter Rail Lot Parking Spaces – Current and Future Potential

Community	Commuter Rail Station	Current No. of Parking Spaces	In use*	Percent usage	Potential/Planned Parking Spaces	Estimated Year of Completion
Fitchburg	Wachusett Station	360	127	35.28%	360	Completed
	Main Street	425	311	73.18%	425	Completed
Leominster	North Leominster	360	133	36.94%	360	Completed
Shirley	Front Street	65	120	184.6%	65	N/A
Ayer	Main Street/Park Street	65	65	100%	200	Under construction
Littleton	Foster Street	250	255	102%	250	Completed
Total		1,530			1,665	

Source: Montachusett Regional Transit Authority

*Parking lot use counted on Thursday July 11, 2019 by MRPC.

Table 4-37 displays the percentage changes in ridership from 2012 to 2018. Due to Wachusett station's introduction in 2016, data to calculate a percentage change for boarding/alighting at Wachusett Station, as well as some percentages for the Fitchburg stop. Most notable is the inbound change for the Littleton stop, an increase of 135.6% boarding and a 700% increase in alighting. Other notable changes include a 50% increase of outbound boarders at the North Leominster stop, a 38% decrease in the same measure at the Shirley stop, and in 71.6% increase in outbound alighting at the Littleton station.

The changes in daily ridership can be seen in Figure 4-60. The trend seems to indicate that ridership is holding steady, with a large increase at the Littleton station. Once again data for 2012 ridership for Wachusett Station is unavailable due to its introduction in 2016.

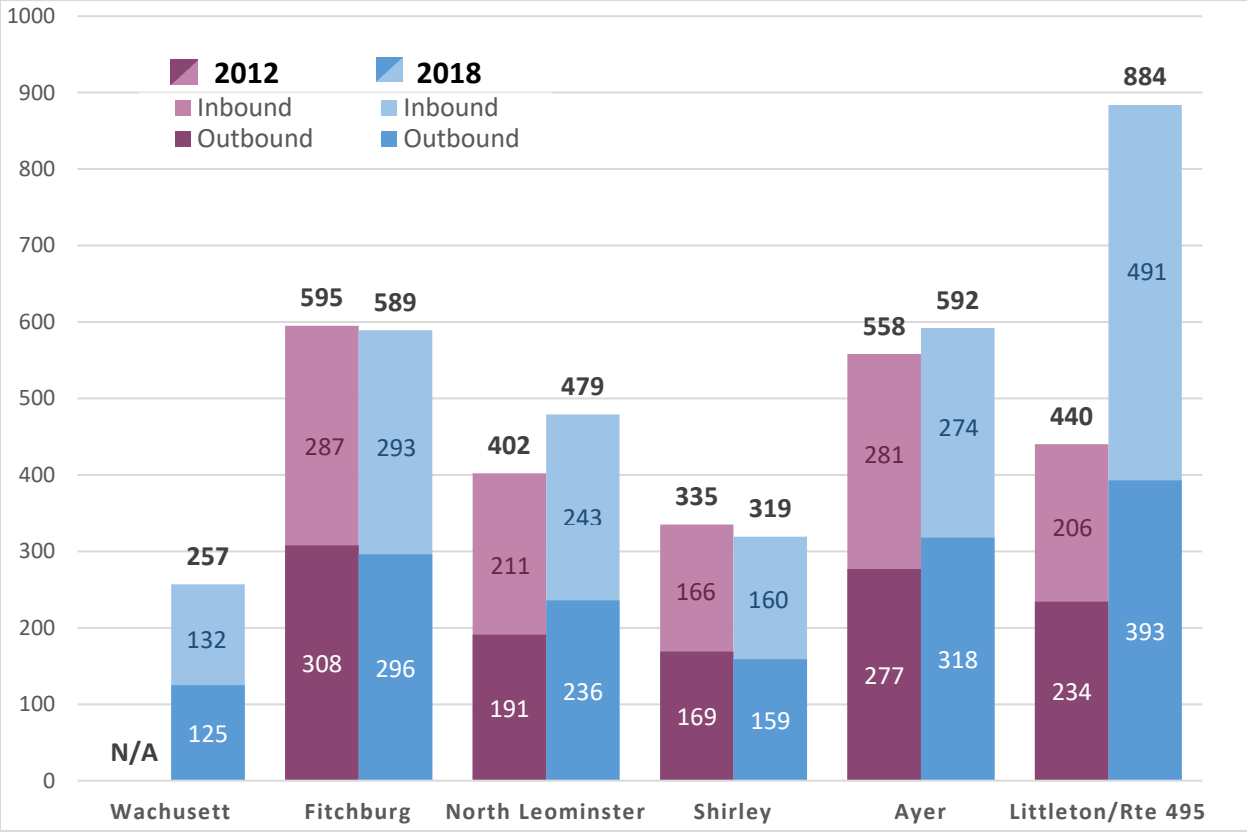
Table 4-37: Percentage Change in Commuter Ridership from 2012 to 2018

	Inbound		Outbound	
	Boarding	**Alighting**	**Boarding**	**Alighting**
Wachusett	n/a	n/a	n/a	n/a
Fitchburg	n/a	n/a	n/a	-3.9%
North Leominster	11.8%	n/a*	50%	23.3%
Shirley	-4.5%	8.3%	-38%	-3.2%
Ayer	-2.0%	-6.3%	-9%	18.2%
Littleton/Rte 495	135.6%	700.0%	-22%	71.6%

Source: Massachusetts Bay Transit Authority and Central Transportation Planning Staff

*Data collected by the MBTA and the CTPS did not record any alighting at the North Leominster stop during their study in 2012, and therefore a percent change cannot be calculated.

Figure 4-60: Commuter Rail Daily Ridership, 2012 vs 2018



Source: Massachusetts Bay Transit Authority and Central Transportation Planning Staff

Trends

Analysis of ridership on all MART services indicates a decrease in ridership, which is being experienced all over the country. Filling service gaps, meeting service needs, and increasing accessibility to residents continues to be a priority for MART. MART has been making improvements to its facilities to increase energy efficiency, and continued improvements to its parking facilities at commuter rail stations will benefit commuter ridership and the residents of the Montachusett region.

Recommendations

In order to provide increased mobility for Montachusett area residents that do not own automobiles or that choose to be less dependent on a personal vehicle, MART will need to continue to refine and implement public transit programs designed to increase ridership. It will be necessary to examine the routes and schedules to determine the most efficient and effective service. MART is open to expanding services wherever possible to fill service gaps, meet unmet regional needs and increase accessibility to health facilities and social services. Where is becomes apparent that certain services are needed, for example evening transportation to local colleges (Mount Wachusett Community College, Fitchburg State University, etc.), MART should continue to work with those institutions to examine requests, organizational involvement and ways to help defray the cost of the additional services. Continued participation of local industries, businesses, major shopping centers and schools in developing appropriate schedules, routes and promotional programs is an important part of this ongoing planning and implementation of services.

Special service provided to the elderly and the disabled will need to be monitored to insure continuation of appropriate levels of service in light of MART's complementary ADA plan. Continue brokerage programs with the Department of Public Health, Department of Developmental Services, MassHealth, Department of Mental Health, MRC, and MCB.

In addition to increased and improved routing and scheduling, it will be necessary for MART to maintain and improve the operating condition of its vehicle fleet. The present vehicle fleet is constantly being replaced with new lift equipped ADA compliant

equipment. The Montachusett TIP process should continue to be utilized to upgrade and replace buses and vans for the MART fleet, as well as continue to upgrade maintenance facilities.

It is recommended that MART collaborate with municipalities to lift the age requirement on the Council on Aging public transportation vehicles in order to provide service to a larger portion of the community. The Council on Aging van services could be expanded to operate on weekends and nights so that those who utilize the service have more scheduling opportunities.

It is recommended that MART increases its social media presence to better promote services and information to the community. MART could collaborate with local municipalities to promote available public transit options on the municipalities' websites and social media pages. It is recommended that MART disseminates information through traditional media like local newspapers, local access television, and radio. It is also recommended that MART consider holding periodic training sessions in order to teach users on how to read and follow bus schedules.

Most of the above actions are designed to improve efficiency and lower overall demand on the highway system at a relatively low cost. In summary, there are several key and identifiable avenues by which the MART system can be both properly maintained and improved. They are:

- Continued monitoring of routes and schedules so that any beneficial changes can be identified and implemented;
- Alternative sources of funding for continued transit operations must be developed and instituted;
- The marketing effort must be upgraded and increased to inform the public of transit availability and efficiency;

- Additional equipment such as radios, lift equipped trolleys, lift equipped buses, lift equipped vans, etc., should be acquired;
- Driver safety, CPR, first aid, and sensitivity courses should be maintained;
- Transit services for the elderly and disabled should continue to be upgraded as necessary to insure both availability and accessibility in compliance with MART's ADA complementary paratransit plan;
- Paratransit services provided by MART to social service agency clients should continue to be monitored for coordination of effort;
- Brokerage programs with Department of Public Health, MassHealth, Department of Mental Health, MRC, MCB, and Department of Developmental Services should be monitored for greater coordination and continued use of private enterprises.
- MAP Purchases for Elderly and Disabled Services (Section 5310).
- Collaborate with MART and municipalities to lift age restriction on COA public transit as well as increase service hours in order to better serve the communities that rely on COA public transit.
- Increase social media presence to better promote information (such as schedules, services, etc) to local community; hold periodic training sessions for the communities on how to read schedules

The following are recommendations limited to commuter rail operations that likely effect the identified target populations.

- Increase available parking at the Shirley, Ayer and Littleton commuter rail stations.
- Extend train service to Gardner.
- Improve Handicapped accessibility at Shirley and Ayer Train Stations.
- Explore possibility of a regional commuter rail facility in the Devens Enterprise Zone.

ENVIRONMENT & CLIMATE CHANGE

Environment and climate change are important areas of consideration for transportation planning. The Montachusett Region needs to help protect and minimize negative impacts to its many areas of environmental value and its air, water, soil and wildlife. Along with environmental protection, the Montachusett Region hopes to reduce greenhouse gas emissions which contribute to global climate change. This section will discuss the current and future activities the Montachusett Region is undertaking to protect its environment and reduce greenhouse gas emissions.

> "The threats that climate change poses to transportation systems–including flooding, changes in average temperatures, and extreme weather events–are clear. But MPOs and DOTs have little if any information on precisely what impacts they can expect, where, and in what time frames. As a result, agencies are largely not acting to adapt the transportation system to climate change, or are waiting for further guidance on the topic."
>
> – FHWA *Integrating Climate Change into the Transportation Planning Process*

In response to building concerns on the effect of global climate change and the development of The Commission on the Future of Transportation in the Commonwealth, the MRPC has looked at ways climate change will impact the Montachusett Region. In particular, staff has focused on potential flooding by identifying flood prone areas and the effects that it will have on each community in relation to major transportation infrastructure. Transportation infrastructures such as roadways, bridges, rail lines etc. are essential for the economic wellbeing of our region. More than half the country's population now lives along the nation's coasts, and one third lives in the highly populated coastal areas of the Northeast. The area between Boston and Philadelphia is one of the most populous areas of the country. The Montachusett region, being a part of this larger corridor, not only has infrastructure which carries regional significance, but national as well.

Regional Significance

"Global climate change affects the coastal areas with rising air temperature, increasing rainfall, rising ocean temperatures and rising sea levels, which lead to increased coastal flooding. In addition to sea level rises, much of the Northeast shoreline is gradually sinking, increasing the effects of rising ocean waters." Even though there are no coastal areas in the Montachusett region it is important to note other effects climate change may have on inland areas. "The Northeast is projected to see a steady increase in precipitation, with total increase of around 10 percent, about four inches per year, by the end of the century. It is winter precipitation that is rising fastest, with more precipitation expected to fall as rain rather than snow. Rainfall is expected to become more intense and periods of heavy rainfall are expected to become more frequent."[i] Since flooding is a major concern to transportation infrastructure in the region, it is important to identify and recognize areas which are vulnerable to such events.

The flood zone maps at the end of this document show Federal Emergency Management Agency (FEMA) 100-year flood zones in the Montachusett region. A 100 year flood is "calculated to be the level of flood water expected to be equaled or exceeded every 100 years on average. The 100-year flood is more accurately referred to as the 1% annual exceedance probability flood, since it is a flood that has a 1% chance of being equaled or exceeded in any single year."[ii]

The map ***FEMA 100-Year Flood Zones, MA DOT Bridges, and DCR Dams*** in the appendix shows all "High" and "Significant" hazard dams in the region and bridges that structurally deficient. According to the Massachusetts Highway Project Development and Design Guidebook, a *structurally deficient* bridge is defined as "a bridge structure that has a defect requiring corrective action."[iii]

Dams are shown by their Hazard Codes, a system that categorizes dams according to the degree of adverse incremental consequences of a failure or mis-operation of a dam. The hazard potential classification does not reflect in any way on the current condition of the dam (e.g., safety, structural integrity, flood routing capacity), rather the potential hazards downstream that would

be realized by a failure. Three classification levels are *Low, Significant, and High.* According to the Massachusetts Office of Dam Safety a…

High Hazard Potential dam refers to dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).

Significant Hazard Potential dam refers to dams located where failure may cause loss of life and damage home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities.

Low Hazard Potential dam refers to dams located where failure may cause minimal property damage to others. Loss of life is not expected.

Table 4-38: High Hazard Dams in the Montachusett Region

HIGH HAZARD DAMS IN THE MONTACHUSETT REGION				
Dam Name	**City/Town**	**Ownership**	**Regulating Authority**	**ID Code**
Lower Naukeag Lake Dam	Ashburnham	Municipality	Office of Dam Safety	MA00002
Upper Naukeag Lake Dam	Ashburnham	Municipality	Office of Dam Safety	MA00003
Winnekeag Lake Dam	Ashburnham	Private	Office of Dam Safety	MA00007
Lake Wampanoag Dam	Ashburnham	Private	Office of Dam Safety	MA00010
Ashby Reservoir Dam	Ashby	Municipality	Office of Dam Safety	MA00334
Whites Mill Pond Dam	Winchendon	Private	Office of Dam Safety	MA00630
Lake Monomonac Dam	Winchendon	Municipality	Office of Dam Safety	MA00631
Whitney Pond Dam	Winchendon	Municipality	Office of Dam Safety	MA00633
Crocker Pond Dam	Westminster	Private	Office of Dam Safety	MA00638
Westminster Reservoir Dam	Westminster	Private	Office of Dam Safety	MA00639
Wyman Pond Compensating Reservoir Dam	Westminster	Municipality	Office of Dam Safety	MA00641
Hickory Hills Lake Dam	Lunenburg	Private	Office of Dam Safety	MA00851
Fall Brook Reservoir Dam and Dike	Leominster	Municipality	Office of Dam Safety	MA00869
Notown Reservoir Dam	Leominster	Municipality	Office of Dam Safety	MA00870
Scott Reservoir Dam	Fitchburg	Municipality	Office of Dam Safety	MA00871
Lovell Reservoir Dam	Fitchburg	Municipality	Office of Dam Safety	MA00872
Wrights Reservoir Dam	Gardner	Municipality	Office of Dam Safety	MA00117
Cowee Pond Dam	Gardner	Municipality	Office of Dam Safety	MA00118
Perley Brook Reservoir Dam	Gardner	Municipality	Office of Dam Safety	MA00119
Lake Shirley Dam	Lunenburg	Municipality	Office of Dam Safety	MA00455
Lost Lake Dam	Groton	Municipality	Office of Dam Safety	MA00808
Greenes Pond Dam	Fitchburg	Municipality	Office of Dam Safety	MA00875
Overlook Reservoir Dam	Fitchburg	Municipality	Office of Dam Safety	MA00876
Snows Mill Pond Dam	Fitchburg	Private	Office of Dam Safety	MA00878
McTaggarts Pond Dam	Fitchburg	Municipality	Office of Dam Safety	MA00879
Rockwell Pond Dam	Leominster	Municipality	Office of Dam Safety	MA00882
Pierce Pond Dam	Leominster	Private	Office of Dam Safety	MA00883
Wachusett Reservoir Dam	Clinton	State	Office of Dam Safety	MA00886
Cresticon Upper Dam	Athol	Private	FERC Jurisdiction	MA00932
Crescent Street Dam	Athol	Private	Office of Dam Safety	MA00934
Birch Hill Dam	Royalston	Federal Agency	Army Corps of Engineers	MA00963
Tully Lake Dam	Royalston	Federal Agency	Army Corps of Engineers	MA00970
Bickford Pond Dike	Hubbardston	Municipality	Office of Dam Safety	MA01022
Wachusett Reservoir North Dike	Clinton	State	Office of Dam Safety	MA01294
Lovell Reservoir Dike	Fitchburg	Municipality	Office of Dam Safety	MA01334
Lake Samoset Dam	Leominster	Private	Office of Dam Safety	MA00866
Notown Reservoir Dike	Leominster	Municipality	Office of Dam Safety	MA01240
Overlook Reservoir Dike	Fitchburg	Municipality	Office of Dam Safety	MA01236
Falulah Reservoir Dam	Fitchburg	Municipality	Office of Dam Safety	MA02312
Red Dam	Winchendon	Municipality	Office of Dam Safety	MA02345
Damon Pond Dam	Ashby	State	Office of Dam Safety	MA02518

Environmental Impacts of Transportation

The environmental impact of transportation is significant because it is a major user of energy, and burns most of the world's petroleum. This creates air pollution, including nitrous oxides and particulates, and is a significant contributor to global warming through emission of carbon dioxide.[iv] One of the most well documented human contributors to climate change is emissions from automobiles. According to the Environmental Protection Agency (EPA) around 14% of all global greenhouse gas emissions are from the transportation sector and almost all (95%) of the world's transportation energy comes from petroleum-based fuels, largely gasoline and diesel. A significant contributor to overall transportation emissions is congestion on our roadways, causing cars to idle and produce more byproduct from burning fuel.

> Transportation generates 30 percent of America's total global warming emissions, including more than one-third of all U.S. carbon dioxide emissions.
>
> More than 60 percent of U.S. transportation emissions come from cars and light trucks.
>
> Source: EPA

Regional Initiatives

Environment and climate change are important areas of consideration in transportation planning. It is important to account for the most vulnerable infrastructure when considering improvements and planning future developments. Efforts to prepare and mitigate the effects of climate change have been made and are currently underway in the region which MRPC has been both directly and indirectly involved in. The following are brief descriptions of such efforts.

Montachusett Regional Stormwater Development Program

During the 2016/2017 UPWP MRPC developed a Stormwater Data Collection App which was made available to member communities required to abide by the EPA's MS4 Permit. This app is capable of collecting GPS coordinates and pertinent information of stormwater assets in the field. MRPC continues to offer support to member communities who wish to utilize the app.

Central Massachusetts Evacuation Plan Mapping

MRPC, in coordination with the Central Massachusetts Planning Commission (CMRPC) and the Central Massachusetts Homeland Security Council, developed a data assessment/SWOT Analysis (strategic planning method to evaluate the Strengths, Weaknesses, Opportunities and Threats) of existing conditions, that was included in the development of a county-wide evacuation plan. This multiyear project was completed in 2016 and was partially funded through the Homeland Security Council and focused mainly on the development of evacuation zones, critical infrastructure, demographic data and the designation of evacuation routes.

Multi-Modal Corridors

To lessen the reliance on driving and burning fossil fuels, which contributed to global climate change, the region is initiating programs that make it easier and safer to have more transportation mode choices. Within the Montachusett region, this includes the development and promotion of bicycle and pedestrian trails and lanes and the establishment of Safe Routes to School and Complete Streets programs in member communities.

Over the last few years, the MRPC has utilized GIS mapping to document where various pedestrian, bicycle and mixed-use trails are in the region. All 22 MRPC communities and Devens have been surveyed and mapped. An inventory is available for the public that shows trails which are available for use. Using trail inventories in these ways can encourage the use of bike and pedestrian modes of travel and might be a first step in planning for future trail construction.
The MRPC also works to assist communities with walkability and complete streets. In 2012, Walkability studies were conducted in the towns of Groton and Westminster and in 2019 Lunenburg was studied. These planning documents were requested to study the downtown areas of each town and how walkable or accessible they are for residents and visitors. These reports showed detailed information for traffic counts, sidewalk inventory and condition, points of interest locations, etc. The MRPC was also hired by the town of Shirley to assist with their Complete Streets Prioritization Plan which was approved in 2018.

Trail Inventory

This project was driven by the Montachusett Regional Trail Coalition (MRTC). The MRTC is focused on trail connectivity by establishing new trails as well as maintaining the existing trail network. This group was formed in March 2012 and is made up of state and local officials and other interested parties who are passionate about trails in the region. These individuals made a request to MRPC for assistance with developing a regional trail map that can be used to boost trail interest, awareness and tourism for the region. The Montachusett Region Trail Guide was published in 2014 and was distributed to various locations across the region including all public libraries, town halls and visitors' centers. A trail inventory update was conducted in 2017 and an updated Regional Trail Guide was created in 2018.

Renewable Energy

The Montachusett Region has worked to increase the use of renewable energy sources. Some Montachusett Region communities have Wind-Energy Bylaws and Wind-Energy Turbines. The Montachusett Regional Planning Commission (MRPC) also has a Regional Energy Plan.

Montachusett Regional Energy Plan

The MRPC completed the development of a Regional Energy Plan. In the fall of 2011 MRPC was awarded $66,000 from the federal Department of Commerce's Economic Development Administration (EDA) to put together the plan. The goal of the plan is to make recommendations to the Montachusett Region's 22 communities to promote the reduction of electricity used, energy used for transportation, an non-electric energy used for heating; replacement of fossil fuels with renewable resources and the reduction of global climate change emissions. The scope of work for this project included a renewable energy regional inventory (mentioned above), design and construction of energy educational exhibits, and series of community workshops. An assessment and analysis of the Montachusett Region Current Energy Needs/Demands (by end-user) was also undertaken. Based upon this information, Worcester Polytechnic Institute students worked to build a system dynamics simulation model of future energy demands and

needs within the Montachusett Region. The model can be used to simulate a variety of path-altering scenarios. The study and its recommendations can be found on the MRPC.org website in the Comprehensive Planning section under "Energy Planning".

Renewable Energy Systems

Throughout the Montachusett Region, there are various renewable energy systems including wind turbines, solar photovoltaic, geothermal, landfill gas, hydro, and biomass. In recent years, there has been an increase in these types of systems throughout the region. The increase in renewable energy systems is helping relieve the demand on burning fossil fuels which lowers CO_2 emissions and greenhouse gases.

Siting of Renewable Energy Facilities

The Montachusett Regional Planning Commission (MRPC) and the Northern Middlesex Council of Governments (NMCOG) were awarded $188,512 in grant funds in fall 2012 from the federal Department of Commerce's Economic Development Administration (EDA) to develop a plan for the Siting of Renewable Energy Facilities for the Montachusett Region and the Northern Middlesex Region.

The goal of this project was to create a Regional Renewable Energy Facility Siting Plan encompassing the MRPC and NMCOG communities containing recommendations for siting and promoting renewable energy facilities. Adequately siting and promoting renewable energy facilities in appropriate locations will decrease reliance on fossil fuels and petroleum products. Currently, there are insufficient siting standards for renewables; therefore developers of renewable energy often do not know what criteria they need to meet in order to develop wind, solar, geothermal, hydropower and other facilities. This project was completed in 2014.

Wind-Energy Bylaws/Ordinances

Wind-Energy Bylaws/Ordinances detail specific height and setbacks requirements for wind-energy systems and provide identified areas in which people are allowed to put up wind-energy

turbines either by right or through a special permit. This provides an easier, quicker and less costly method than obtaining a zoning variance. In communities that do not have wind-energy bylaws/ordinances, a person might need to get a zoning variance to build their wind-energy turbine.

Climate Change Preparedness

In 2017-2018, MRPC was awarded a grant from the MA Office of Technical Assistance and Technology (OTA) and the US Environmental Protection Agency (EPA) to sponsor workshops designed to educate municipal officials, community leaders, Local Emergency Planning Committees (LEPCs) and businesses about the toxic chemicals stored, used and transported through their communities.

MRPC collaborated with OTA, EPA, the New England Consortium, and ESIS Health, Safety and Environmental to develop chemical safety trainings and pollution prevention assessment tools that can be used and adopted in future climate change preparedness planning. The goal was to ensure our region's communities are more capable of addressing climate change-related disasters by providing information and thoughtful preparation needed for targeted planning.

MRPC and OTA hosted trainings for local authorities and vulnerable facilities to help raise awareness on the issue and as part of their emergency preparedness plans. The trainings built models for incorporating toxics use reduction into community and regional emergency preparedness and climate resiliency planning and supply toxics users with the tools they need to prevent industrial accidents.

Pre-Disaster Mitigation Plans

In 2008, MRPC wrote Natural Hazard Pre-Disaster Mitigation Plans for all 22 communities in the Montachusett Region and in the winter of 2014, MRPC completed the updates to these same plans with funding provided by the Federal Emergency Management Agency through the Massachusetts Emergency Management Agency and the Massachusetts Department of

Conservation and Recreation. These plans identified natural hazards and assessed their risk of occurring. These hazards included climate change as well as flooding, wind, winter storm and fire related hazards. Flooding, droughts and severe winter storms can be caused by climate change's increase in temperature and storm frequency. These plans also included mitigation strategies for these types of hazards ranging from increased drainage management to increased communication between community boards and departments.

Montachusett Regional Transit Authority (MART) Initiatives

Along with environmental protection, the Montachusett Region hopes to reduce greenhouse gases emissions which contribute to global climate change. As a Regional Transit Agency, MART provides public transportation to area residents and visitors. Environmentally friendly initiatives include the outfitting of maintenance facilities in Gardner and Fitchburg with solar power and the inclusion of Hybrid powered buses and cars to their fleet of vehicles. MART continuously looks to upgrade the efficiency of their fleet and currently operates 23 city buses, of which 3 are Hybrids.

Green Communities

The Green Communities Designation and Grant Program helps municipalities become designated as a "Green Community" and provides funding to qualified municipalities for energy efficiency and renewable energy initiatives. The Program is open to all communities served by investor-owned utilities and those served by municipal light plants that adopt the renewable energy charge.

To achieve "Green Community" designation, a municipality must meet five clean energy benchmarks:

- Provide as-of-right siting;
- Provide expedited permitting;
- Establish an Energy Reduction Plan (ERP);
- Purchase only fuel-efficient vehicles; and
- Minimize life-cycle costs.

The MA Department of Energy Resources (DOER) calculates community funding allocations using a formula that provides each community with a $125,000 base grant plus additional amounts based on per capita income and population. The "Green Community" designation also makes municipalities eligible for special initiatives such as electric vehicle charging stations and additional competitive grant rounds subsequent to the initial Green Communities grant.

There are currently sixteen communities in the Montachusett region that are designated Green Communities: **Ashburnham, Ashby, Athol, Ayer, Fitchburg, Gardner, Harvard, Lancaster, Leominster, Lunenburg, Petersham, Royalston, Shirley, Townsend, Westminster, and Winchendon.**. Collectively, these communities have received over $4.5 million in funding through the program which has been used in municipal and school buildings for weatherization, HVAC upgrades, variable frequency drive installations, energy management systems, heating fuel conversions, LED lighting retrofits, energy audits, and building envelope upgrades, to name a few. MRPC is working with **Groton, Hubbardston and Templeton** in 2019 to become designated Green Communities and assists many of our communities with tasks associated with maintaining Green Community status on an annual basis.

MRPC strongly supports the Green Communities Program and we believe becoming a Green Community produces significant energy improvements and cost savings for municipalities. Such action also demonstrates the community's commitment to green energy and environmental protection.

Statewide Initiatives

In May 2016, the Supreme Judicial Court of Massachusetts ruled that the Massachusetts Global Warming Solutions Act (GWSA) requires MassDEP to promulgate new regulations that "impose a limit on [greenhouse gas] emissions that may be released, limit the aggregate emissions released from each group of regulated sources or categories of sources, set emission limits for each year, and set limits that decline on an annual basis" to meet the requirements of Section 3(d) of Chapter 21N of the General Laws.

Executive Order 569 was signed by Governor Baker in September 2016, which directed the Executive Office of Energy and Environmental Affairs (EOEEA) to coordinate and make consistent new and existing efforts to mitigate and reduce greenhouse gas emissions and to build resilience and adapt to the impacts of climate change.

The Executive Order also directed MassDEP to promulgate regulations satisfying the mandate of Section 3(d) by August 2017 to ensure that the Commonwealth meets the 2020 statewide emissions limit mandated by the GWSA.

Trends

Climate change impacts such as global warming is expected to increase the frequency of precipitation and severity of weather events. It is important to anticipate the impact of such factors on transportation infrastructure.

Recommendations

- Encourage the development of more projects which qualify for Congestion Mitigation and Air Quality (CMAQ) funds.
- Maintain the prevalence of environmental factors when reviewing and prioritizing transportation projects.
- Continue to monitor and assess vulnerable infrastructures.

The importance of the environment in the Montachusett region goes beyond just the moral responsibility to protect our planet. Natural resources and attractions which exist in the region could also have economic benefits as well. Both the protection of our environment and the efficient connectivity of people to these assets should play a prominent role in transportation decision making now and in the future. Environmental Performance Measures set in this plan will help ensure progress continues to be made.

[i] "Confronting Climate Change in the U.S. Northeast: Science, Impacts and Solutions," a report of the Northeast Climate Impacts Assessment © 2007 Union of Concerned Scientists.

[ii] Holmes, R.R., Jr., and Dinicola, K. (2010) *100-Year flood–it's all about chance* U.S. Geological Survey General Information Product 106

[iii] Massachusetts Highway Project Development and Design Handbook. (January 2006):

Massachusetts Highway Department; Executive Office of Transportation

[iv] Center for International Climate and Environmental Research (2007). "Climate forcing from the transport sectors"

5 Public Outreach, Input, & Participation

PUBLIC OUTREACH, INPUT AND PARTICIPATION

An important part of the development process for the RTP is public outreach and involvement. To obtain this, several methods were utilized in an attempt to bring as many individuals as possible into the plan development. This included updates at several meetings, targeted emails, online and hard copy surveys and web-based applications. Additionally, during the development of other planning documents, notice of applicability and linkage to the RTP were identified and incorporated.

Public Meetings

Several meetings regularly held by or specifically scheduled by the MRPC were utilized as opportunities for input and discussion of the RTP. These included:

- RTP Workshops
- Montachusett Joint Transportation Committee (MJTC)
- Montachusett Regional Planning Commission (MRPC)
- Montachusett Regional transit Authority (MART) Advisory Board
- Montachusett Regional Comprehensive Economic Development Strategies (MRCEDS) Committee
- Montachusett Regional Trail Coalition (MRTC)
- Community Health Network Area 9 (CHNA 9)
- Community Health Improvement Plan (CHIP)

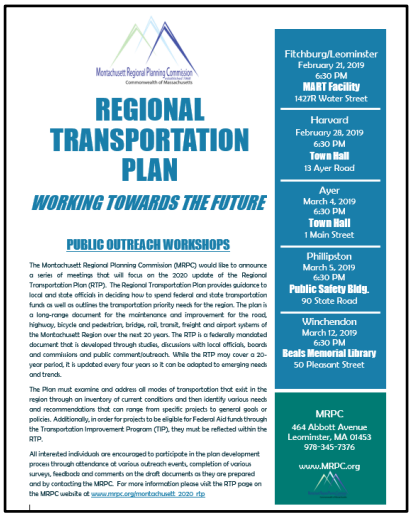
RTP Workshops

A series of meetings were held at five locations around the region to discuss various topics and to solicit input directly related to the RTP development. A mass mailing was disseminated to

various individuals, organizations and groups announcing the time and locations of these meetings. In addition, all relevant information was posted to the MRPC website.

RTP Workshops – Dates & Locations

Date	Location
February 21, 2019	MART Facility Fitchburg/Leominster
February 28, 2019	Town Hall Harvard
March 4, 2019	Town Hall Ayer
March 5, 2019	Public Safety Building Phillipston
March 12, 2019	Beals Memorial Library Winchendon



The following table is a summary of comments made at the RTP Outreach Meetings.

Table 5 - 1. RTP Outreach Meeting Comments

Meeting	Comments
2/21/19 – Fitchburg/Leominster Outreach	Route 2 - Improvements needed. • Mt. Elam Road – dangerous traffic light. Suggestion to buy out property owners and close roadway/eliminate light. Emergency response is also delayed to accidents at the light because it's in Fitchburg and they will be coming westbound and need to turn around to head eastbound where the light is located. More up to date & visible advanced warning signage is needed prior to the light. Solar glare is also a problem here. • Runoff into Monoosnoc Brook near the water filtration plant. MDOT settled a lawsuit against them 8+ years ago. A plan was established to fix the issues but it appears that no work has been done. Route I-190 • Advanced warning signs needed before the merge with Route 2 Prioritize Complete Streets & trail connections Trail priorities – • Connect Twin Cities Rail Trail to the Mass Central Rail Trail • Connect North Central Pathway into Ashburnham and points West • MRTC to work on this at upcoming meetings Game On Fitchburg is currently being built. This is an economic development opportunity. It was mentioned that "active" people will be coming out to this facility so hiking & biking opportunities nearby may be of interest. Route 31 railroad bridge in West Fitchburg is a pinch point. This should be expanded to accommodate the heavy truck traffic and also provide a safe place to connect the Streamline Trail to Wachusett Station.

Table 5 - 1. RTP Outreach Meeting Comments (continued)

2/21/19 – Fitchburg/Leominster Outreach	Route 12 corridor in Fitchburg – potential TIP project. The area closer to down town and to the north. Sidewalks/pedestrian & bike improvements are needed.
RESPONSE: • Route 2 at Mt Elam Road – Pursue discussions with MassDOT regarding prior commitments to address safety and runoff issues; Possible planning activity depending on MassDOT feedback and needs. • Identify planned ITS (Intelligent Transportation Systems) improvements for the I-190 and Route 2 corridors as well as time frame for implementation. • Trail priorities and issues to be part of planned Regional Bicycle and Pedestrian Plans (FFY 2020 Unified Planning Work Program) • Prior improvements identified in and around Wachusett Station and Route 31. Seek feedback from MassDOT regarding project potential. Possible planning activity to prioritize and finalize projects.	
2/28/19 – Harvard Outreach	• Route 117 – Willard Road, no sidewalks. This is a mode shift barrier • No Park & Ride facilities in Harvard or along Route 2 in the area • Ayer Road corridor – good candidate for a bike lane to connect Ayer Center to Harvard Center and to the Nashua River Rail Trail • Devens – trail connections to Harvard (Old Mill Road), connect Ayer rotary area • Encourage strategic connections (future planning) for future TIP projects • Encourage people to force trail/bike/ped accommodates for projects that could create future trail connections
RESPONSE: • Information related to Park & Ride Lots to will be provided to MART for their review. Staff will coordinate with RTA on possible long-range plan related to implementation of Park & Ride Lots along Route 2 corridor. • Trail and sidewalk connections to be discussed in upcoming Regional Bicycle and Pedestrian Plans.	
3/4/19 – Ayer Outreach	• More Ch. 90 money needed, current funding levels have been the same for a number of years and it is impossible for communities to keep up with maintenance of their roads. • Project costs/process is out of control. A community spends much less money than the state on similar projects.
RESPONSE: • The need for additional Chapter 90 funding is a common theme among municipalities. Staff will continue to stress needs to MassDOT and appropriate agencies and officials.	

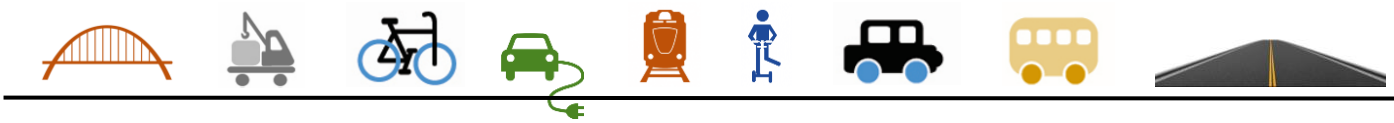


Table 5 - 1. RTP Outreach Meeting Comments (continued)

3/5/19 – Phillipston Outreach	• UPWP project conversation • TIP project process
RESPONSE: • Staff will continue to work with local communities on project and planning study development to address areas of concern.	
3/12/19 – Winchendon Outreach	• No grocery store in town, need better access to grocery store for people without access to car/seniors. • MART needs to do a better job of communicating bus service to the public. Active community members from Winchendon had no clue what service was available. • North Central Pathway and its possible connections to Monadnock region and its assets would boost economy of Winchendon.
RESPONSE: • Comments passed onto MART for their review. • As mentioned previously, trail and sidewalk connections to be discussed in upcoming Regional Bicycle and Pedestrian Plans.	

Regional Planning Documents

Through its work throughout the Region, the MRPC has been and continues to be involved in a number of planning activities. Many of these initiatives and studies address transportation needs and issues as a component of their scope. In several cases, they address certain targeted populations. The following is a summary of some of these studies and their transportation related findings.

Coordinated Public Transit–Human Services Transportation Plan (CPT-HSTP)

The Coordinated Public Transit–Human Services Transportation Plan (CPT-HSTP) documents the Montachusett MPO's unmet human-service transportation needs for individuals with disabilities, low-income individuals (or persons below the poverty level), the elderly and Limited English Proficiency (LEP) persons.

The CPT-HSTP was developed by the MMPO as a tool to help local transportation providers and communities improve transportation services, increase efficiency of service delivery, and expand outreach to meet growing needs. It provides a framework to guide the investment of existing transportation resources and the acquisition of future funds.

As a resource, this plan:

- Evaluates community demographics related to the target populations
- Assesses the transportation gaps and needs of the target populations
- Identifies strategies to address the gaps in transportation services
- Establishes relative priorities of the strategies

The following is a summary of the Priorities, Recommendations and Areas of Emphasis outlined within the CPT-HSTP.

- Extension of Existing Fixed Route Service Hours and Days of Operation.
  a. Extend/Expand Transit Services
  b. Sustain Existing Services and Maintenance of Vehicles

- Medical Transportation Services in Both the Fixed Route Areas and in the Rural Communities
  a. Seek to Extend Medical Services to Rural Communities
- Expansion and Connection of Fixed Route Service to Additional Communities.
- Education and Training of Available Services
- Expand Outreach and Training of Transit Services to Target and LEP Populations
- Encourage Employer Vanpools
- Expand and Increase Commuter Rail Options
- Explore Additional Funding Options
- Explore Fare Options to Encourage Additional Commuter Rail Ridership
- Explore Additional Scheduling Methods for the Individuals with Disabilities and Target Populations
- Encourage More Cooperation Between Communities and Agencies

For the complete CPT-HSTP and all of its analysis and background, please contact the MRPC or refer to the document on the MRPC website: www.mrpc.org/files under the MMPO heading.

Montachusett Region Comprehensive Economic Development Strategy (MRCEDS) - Draft

The MRPC updates the Comprehensive Economic Development Strategy (CEDS) every 5 years and completes an Annual Update of the economic planning and development work accomplished in the Montachusett Region, in accordance with the Montachusett Region CEDS. A Draft Update and Annual Report was developed in May 2019 that identifies the accomplishments of multiple economic development entities and adjusts the MRCEDS' vision, goals, objectives and work plan as needed to reflect changing economic conditions.

The MRCEDS highlights the public meetings and input as well as regional surveys that were conducted to guide and develop the update. Outreach included the MRCEDS Committee, the Montachusett Economic Development District (MEDD), MRPC Planning Commissioners, Chambers of Commerce, representatives of minority groups and low- and moderate-income groups, local officials, business representatives, and other economic development leaders.

Through this outreach effort, the MRCEDS has identified the following strengths, weakness and recommendations.

Regional Strengths

- *Recreational opportunities* - The most commonly identified strength in the Montachusett Region is our abundant recreational opportunities. 71.4% of respondents identified recreational opportunities as either "Somewhat of a strength" or "One of our greatest strengths" in the region.
- *Quality of educational programming provided at the Associate degree level* - 68.6% of survey respondents agreed that the quality of educational programming available at the Associate degree level is a strength of our region. The Montachusett Region has two postsecondary institutions which are driving the success of this programming: Fitchburg State University and Mount Wachusett Community College.
- *Quality of educational programming provided at the K-12 level* - The third most identified strength of the Montachusett Region is the quality of educational programming at the elementary and high school levels. More than half (51.4%) of respondents identified K-12 education as somewhat of a strength, while 8.6% said it is one of the region's greatest strengths.

Regional Weaknesses

- *Quality of transportation infrastructure* - The greatest weakness identified by leaders in the region by a wide margin is the quality of our transportation infrastructure. The challenges associated with maintenance and improvement region's transportation infrastructure are in many ways directly linked to challenges related to housing, business retention, and other elements of successful economic development.
- *Quality and availability of public transportation* - As mentioned … promoting transit and commuter rail options is a major priority for the Montachusett Region. However, 50% of respondents agree that presently the quality and availability of public transportation is one of the region's greatest weaknesses, and an additional 22.2% say it is somewhat of a weakness.

- *Housing options* - A majority (61.8%) of respondents perceived housing options as either somewhat of a weakness (44.1%) or one of the region's greatest weaknesses (17.7%). The Montachusett Region is situated uniquely due to the competitive and comparatively expensive housing options in nearby Boston and Worcester. In order to attract those who may be priced out of these markets, as well as retain those residents who are already here, the Montachusett Region needs to ensure a robust and affordable housing stock.

Possible Opportunities

- *Collaborative Workspaces* - The majority of respondents support the ongoing development of collaborative workspaces in the Montachusett Region. Makerspaces, along with co-working spaces and business incubators, have the mission of creating businesses and providing support for people to develop new employable skills and collaborate with others on business endeavors. Additionally, makerspaces in particular may help the Montachusett Region strengthen its greatest asset of recreational opportunities by providing fun classes and workshops indoors during the tough winter months. Currently, there are a small number of collaborative workspaces being developed in the region, including the Wachusett Business Incubator in Gardner and LaunchSpace, Inc. in Athol.
- *Opportunity Zones* - The designation of Opportunity Zones also poses a potential economic opportunity according to almost half of all respondents. By providing tax incentives to invest in distressed communities, there may be many yet unrealized benefits of these zones. To date, five Montachusett communities (Athol, Clinton, Fitchburg, Gardner, and Leominster) received formal approval of two Census Tracts each (ten total) for designation as federal Opportunity Zones.
- *Recreational cannabis industry* - The current growth of the recreational cannabis industry was included due to its growing role in the region, including occupying and improving the infrastructure of very large commercial and industrial spaces for cultivating, processing, testing, and sales of recreational cannabis. However, this industry poses a number of risks as well, including its legal status at the federal level.
- *Other identified opportunities*

a. Housing - …noted that support should be aimed at attracting people who are being priced out of high cost housing in nearby Boston, and help meet their desire to live close to employment.
b. Life Sciences at Devens - a 40-acre site in Devens was re-zoned to make it eligible for biotechnology firms and manufacturers with ample office, industrial, and research and development spaces. At the time, MassDevelopment anticipated the rezoning would support hundreds of new permanent jobs in the region, with up 350 to 500 new skilled positions with the addition of a biomanufacturing facility

Potential Threats

By a significant margin, the region's aging infrastructure was chosen as the greatest threat to our region's economic well-being. The connection between transportation infrastructure and economic vitality is critical and is explained in greater detail in the forthcoming 2020 Montachusett Regional Transportation Plan.

Goals and Objectives

As part of the CEDS update, and in response to key trends and our regional outlook, goals and objectives for the region were developed under ten independent (but highly interrelated) categories:

1. Infrastructure Development
    a. Conduct an analysis of livability by municipality to identify strengths as well as areas for improvement within the region. Start by establishing a list of characteristics for communities where people are moving in and then do a regional assessment of municipalities to provide productive feedback on infrastructure, cultural, and civic improvements/changes; and
    b. Advance high-quality infrastructure and community improvements to support development, redevelopment and revitalization of the built environment.
2. Regional Cooperation
3. Regional Promotion
4. Local Business Creation and Support

5. Workforce Attraction and Retention
6. Redevelopment and Reuse
7. Education
8. Housing
    a. Focus resources and investments on helping existing residents, including students, young adults, and families to stay in the area. Support establishing creative tax policies to incentivize investment in existing and development of new high-quality housing stock, develop first time homebuyer assistance, create student loan repayment programs, and research other strategies designed to retain population;
    b. Identify target properties, parcels, and areas for housing or mixed-use development. Prepare a financial feasibility analysis on each and create incentives to spur development of a variety of housing solutions in communities that are feeling the greatest pressure; and
    c. Conduct a region wide housing needs and opportunities assessment, including utilizing existing work that has been done. Use this to establish a comprehensive understanding of the gaps in housing supply for current and future population. Establish an inventory of available funding and financial assistance programs for housing development and redevelopment work. Identify funding gaps and mechanisms for filling those gaps. Identify zoning or other regulations that hinder effective residential development needed to respond to current market needs.
9. Public Health and Safety
10. Energy and Resources

For the complete MRCEDS Update and all of its analysis and background, please contact the MRPC or refer to the MRPC website.

Regional Needs Assessment Survey Report

This project was developed as a method to augment data collected from past MART rider and non-rider surveys and to expand the analysis among four key elements for transportation needs in the region. Distribution of the survey focused on large business employers, elderly and disabled populations, medical offices and higher education facilities. As part of this effort, the Montachusett Regional Planning Commission (MRPC) worked with the Community Health Network of North Central Massachusetts (CHNA9) and Fitchburg State University (FSU). The overall goal for this project is to develop a better and more comprehensive understanding of the transportation needs of the region which will help lead to more focused transportation and transit projects.

Methodology

The MRPC worked with the CHNA9 Transportation Subcommittee to develop four different but comparable surveys based on the identified target population groups or institutions. These target groups were as follows:

1. Large business employers (50 or more employees);
2. Elderly and disabled populations in the Region (based on 2010 Census data);
3. Medical facilities (hospitals and medical centers/offices);
4. Higher education institutions (FSU and Mount Wachusett Community College (MWCC)).

Upon completion of the surveys, a list of distribution sites was established. Sites were identified based on local knowledge and existing outreach lists for each specific target group or facility. The overall goal was to gather approximately 400 surveys per identified group across all areas of the Montachusett Region.

As data is received, any paper surveys were entered into the online questionnaires on Survey Monkey. This allowed for easier analysis of the responses. The following is a summary of responses by target group as of September 6, 2018.

1. Large Business Employers – 312
2. Elderly/Disabled Populations – 174
3. Medical Facilities – 291

4. Higher Education – 181

Based upon responses as of September 6th, certain key or repetitive issues can be identified. A certain amount of caution is needed however when reviewing these items as final results and analysis is still pending. Never the less, the following appear to be point of interest for each of the target groups.

Preliminary Key Issues

a. Large Business Employers
   - Approximately 84% of respondents would use transit to work if available;
   - Cost Effectiveness and reliability are cited as most the important factors towards transit use;
   - About 50% would be interested in a company run shuttle followed by a bus and rideshare;
   - 53% cite transportation as a major factor in applying for a job;
   - Extended bus routes and times for non-traditional work hours and shifts;
   - Cost is also an issue.

b. Elderly/Disabled Populations
   - Approximately 42% to 45% use a Council-on-Aging or MART van;
   - 75% would use it more often if it were available;
   - Cost effectiveness and reliability were cited as the most important factors regarding transit use;
   - Over a 3-month period, almost 62% were unable to a make a medical appointment due to lack of transportation;
   - 57% said transportation was a major factor in whether or not they schedule a medical appointment;
   - Lack of knowledge regarding transportation options was identified by 54% of respondents;
   - Over half (59%) were on some form of benefit program;
   - More COA vans were cited as recommendation;

c. Medical Facilities

- Over 61% do not use public transit to get to their medical appointments;
- About 71% would use transit if it was an option;
- 75% cite reliability as an issue;
- Cost effectiveness and reliability were the most important issues when it comes to public transportation;
- Approximately 31% would be willing to pay $5.00 or more for a one-way ride to an appointment;
- Respondents mentioned that the bus and a ride share option, such as Uber, were their preferred public transportation options but would rather drive their own vehicle out of convenience;
- Longer service hours were identified as a recommendation;
- Easier or quicker scheduling options and better promotion of services were also identified.

d. Higher Education

- Approximately 33% use transit to get to and from school;
- 48% cite reliability as an issue;
- Approximately 58% commute 30 minutes or less to school;
- Students sited more bus frequency, better time reliability, longer hours of operation, fare discounts and larger service area as issues that affect their use of transit.

North Central Mass Community Health Improvement Plan 2020 & 2017 Annual Report

The CHNA9 worked with a number of groups and organizations to develop a Community Health Improvement Plan (CHIP). According to the plan, "A CHIP is a broad, action-oriented strategic plan to improve the health of the community, based on the needs identified by Community Health Assessments. The North Central CHIP is based on the 2012 and 2015 Community Health Assessments conducted for our region. It includes five priority areas with goals, objectives, strategies and measures to address them."

The five priority areas are:

Table 5 – 2. CHIP Priority Areas

Priority Area	Based on
Healthy Eating and Active Living	High rates of diabetes/heart disease/obesity
Healthy and Safe Relationships	High rates of domestic violence and child abuse/neglect
Mental and Behavioral Health and Substance Abuse	High rates of smoking, alcohol, and opioid abuse and an ongoing shortage of beds/services for mental and behavioral health
Transportation and Access	Data showing transportation as a major barrier to accessing health care, jobs, social services, and healthy foods
Racial Justice	Racial tensions at the national and local levels, immigration policy and enforcement concerns, and data showing inequitable access to career and education opportunities.

"A CHIP is an established, evidence-based tool for responding to the results of a community assessment. It establishes a shared framework for partners from many sectors so that identified community needs can be addressed at the systemic level, harnessing collective resources and political will, and coordinating strategies between multi-sector organizations and communities." (source: CHIP 2020)

The following summarizes the Transportation and Access Priority Area's Goals and Strategies.

Goal: Improve transportation services and systems to ensure equitable access for diverse communities.

Objective 4.1: By 2020, restructure existing transit service options in North Central to better align with the needs of current and prospective consumers.
4.1.1: Form an accountability board that will conduct annual performance reviews of transit service providers and gaps as identified by consumers and prospective consumers and will review and call attention to and address policy issues and policy enforcement issues that affect utilization. 4.1.2: Work with transit providers to restructure eligibility guidelines for transportation vouchers. 4.1.3: Advocate for fixed buses to have fixed stops (end of flagging system except for people w/ special considerations) and for buses to announce upcoming stops and have visible LED signs showing the next stop.
Successful 2020 Outcomes
• Ridership of existing transit options in North Central has increased by 15%. • Average ride time relative to distance traveled via public transit has decreased by 40%. • Availability of transit services and connections at peak times has increased by 10%.

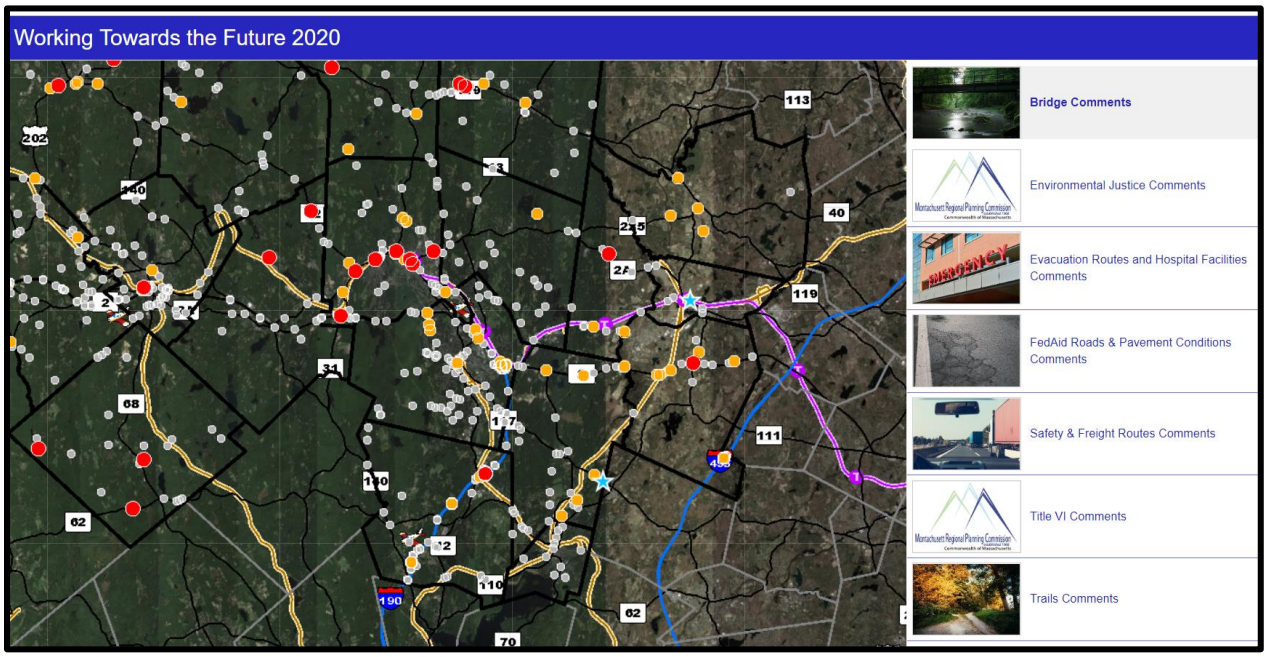
Objective 4.2: By 2020, increase public knowledge and usage of available transit service options within North Central.
4.2.1: Work with the Montachusett Regional Planning Commission to create an accessible database of transportation options geared toward health and human service providers. 4.2.2: Advocate to increase the number of bus shelters with schedules, including a signal for vision impaired indicating when the next bus will arrive. 4.2.3: Advocate to increase the amount of language appropriate visible bus signage. 4.2.4: Advocate for funding for an increased number of travel trainers with area language skills and cultural competence.
Successful 2020 Outcomes
• Ridership of existing transit options in North Central has increased by 15%. • 75% of health and human service providers surveyed report an increased knowledge of existing transportation options for their clients. • 50% of surveyed consumers within public transit service areas report an increased knowledge of existing transit service options.

Objective 4.3: Identify the top five service gaps within North Central and successfully advocate for at least one of those gaps to be closed by 2020.
4.3.1: Partner with Montachusett Regional Planning Commission and other regional groups to conduct transportation gap study. 4.3.2: Establish bus routes or other transit options in unserved communities as needed based on transportation gap study. 4.3.3: Work with transit providers to increase bus routes and other transit options in the evening and on weekends. 4.3.4: Organize constituencies of local citizens and civic leaders to raise awareness of identified transit gaps/needs and to advocate for projects intended to close those gaps.
Successful 2020 Outcomes
• Service gaps have been identified in a comprehensive study. • Service hours have increased in response to the study results. • At least one new service or service expansion has been created to address an identified gap.

Montachusett RTP Online Comment Applications

As part of the public input process, the MRPC's GIS department developed an online application that allowed individuals to review current data and information and to leave comments regarding different areas of interest. Comment sections included: Bridges, Environmental Justice, Evacuation Routes, Federal Aid Roads & Pavement Conditions, Safety & Freight, Title VI and Trails. The overall goal was to encourage individuals to identify issues and or locations of concern that might then be incorporated into the RTP.

Figure 5 - 1. Montachusett Online Comment Application



Some 35 comments were posted to the website on four of the seven map applications. The over majority were related to the Federal Aid Roads & Pavement Conditions map. The following table summarizes the types of comments received.

Table 5 - 3. Montachusett Online Comment Application - Comments

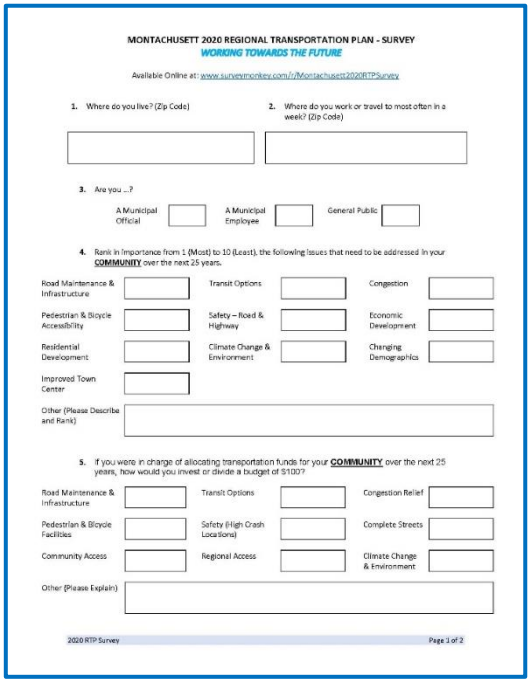
Comment App	Comment Type	Response
Federal Aid Roads & Pavement Conditions	Accident Locations; Geometric Deficiencies; Intersection or Locations That Need to be Addressed; Enforcement Areas; Speed Issues; Pavement Issues	Specific locations were noted and will be reviewed as part of Safety Analysis or possible future UPWP planning task.
Safety & Freight	Geometric Deficiencies; Areas of Congestion; Improper Motorist Behavior; Truck Access Issues; Accident Issues & Locations	Areas of concern will be addressed in current or planned work activities. This includes freight issues and safety analysis programs.
Trails	Trail Support; Bicycle Usage Support	Trail support will be noted in planned Regional Bicycle and Pedestrian Plans.
Evacuation Routes	Facility Update	Routes discussed as part of Homeland Security participation work.
Bridges, Environmental Justice, Title VI	No Comments Provided	

Outreach Survey

The MRPC developed a survey for distribution throughout the region that would help in the development of this RTP. Primarily, it would help to identify the mood of the region towards various programming options and needs as well as shape potential planning scenarios. This chapter outlines the survey, the responses received and conclusions drawn from the results.

The Survey

The survey was devised to be short, easy to answer and hopefully, provide insight to the needs of the Region. Respondents were asked to identify themselves as municipal employees or officials or as members of the general public. This would help us compare community needs from both the professional and public points of view.



MONTACHUSETT 2020 REGIONAL TRANSPORTATION PLAN - SURVEY

WORKING TOWARDS THE FUTURE

Available Online at: www.surveymonkey.com/r/Montachusett2020RTPSurvey

1. Where do you live? (Zip Code)
2. Where do you work or travel to most often in a week? (Zip Code)

3. Are you ...?

A Municipal Official | A Municipal Employee | General Public

4. Rank in importance from 1 (Most) to 10 (Least), the following issues that need to be addressed in your **COMMUNITY** over the next 25 years.

Road Maintenance & Infrastructure		Transit Options		Congestion	
Pedestrian & Bicycle Accessibility		Safety – Road & Highway		Economic Development	
Residential Development		Climate Change & Environment		Changing Demographics	
Improved Town Center					
Other (Please Describe and Rank)					

5. If you were in charge of allocating transportation funds for your **COMMUNITY** over the next 25 years, how would you invest or divide a budget of $100?

Road Maintenance & Infrastructure		Transit Options		Congestion Relief	
Pedestrian & Bicycle Facilities		Safety (High Crash Locations)		Complete Streets	
Community Access		Regional Access		Climate Change & Environment	
Other (Please Explain)					

2020 RTP Survey — Page 1 of 2

The survey was made available at each of the public outreach workshops put on by the MRPC, at meetings of the MPO, MJTC and full Commission and online via SurveyMonkey.com. In addition, notices regarding access to the survey were distributed multiple times to all members of the RTP mailing list. From this outreach effort, some 200 responses were received.

Questions, Responses and Observations

The following section reviews each question individually, summarizes the responses received and draws observations based upon an analysis of the data.

Question 1 - Where do you live? (Zip Code)

This question simply asks the respondent to identify the primary place of residents by zip code.

Table 5 - 4. RTP Survey Respondents by Community

MRPC Communities	
Respondent Communities	**No.**
Ashburnham	25
Ashby	6
Athol/Phillipston	3
Ayer	3
Clinton	2
Devens	2
Fitchburg	18
Gardner	3
Groton	7
Harvard	45
Hubbardston	5
Lancaster	2
Leominster	3
Lunenburg	6
Petersham	1
Shirley	2
Sterling	2
Townsend	28
West Townsend	5
Westminster	4
Winchendon	11
Total Respondents	**183 90.15%**

Outside MRPC Region	
Respondent Communities	**No.**
Arlington	1
Barre	2
Batavia NY	1
Belchertown	1
Chicopee	1
Concord	1
Fitzwilliam NH	1
Holden	3
Hudson	1
Nashua NH	1
Paxton	1
Pepperell	3
Princeton	1
West Boylston	1
No Response	1
Total Respondents	**20 9.85%**

- Of the 203 responses, over 90% were from residents of the 23 MRPC members (22 communities plus Devens). All but two municipalities, Royalston and Templeton, were represented.
- The remaining 20 respondents were from communities outside of the planning region. On survey participant did not respond to the question.

Question 2 - Where do you work or travel to most often in a week? (Zip Code)

This question followed up the where do you live question by seeking to ascertain where respondents most often traveled to in a week in order to develop some travel patterns.

Table 5 - 5. RTP Survey Respondents Communities

MRPC Communities	
Respondent Communities	**No.**
Ashburnham	16
Athol/Phillipston	2
Ayer	7
Clinton	1
Devens	6
Fitchburg	18
Gardner	8
Groton	8
Harvard (Still River 1)	17
Hubbardston	3
Leominster	12
Lunenburg	2
Shirley	2
Sterling	3
Templeton (E Templeton)	1
Townsend	10
Westminster	4
Winchendon	5
Total Respondents	**125 61.58%**

Outside MRPC Region	
Respondent Communities	**No.**
Acton	3
Amherst MA	1
Andover	1
Barre	1
Batavia NY	1
Bedford	1
Bolton	1
Boston	4
Boxborough	1
Brookline NH	1
Burlington	1
Cambridge	3
Concord	6
Dracut	1
Framingham	1
Hanscom AFB	1
Holden	2
Hollis NH	1
Hudson	1
Littleton	6
Lowell	3
Marlborough	1
Milford NH	2
Nashua NH	2
Natick	2
Northborough	1
Princeton	2
Rindge NH	2
Sudbury	1
Tyngsboro	1
West Boylston	1
Waltham	1
West Medford	1
West Roxbury	1
Westborough	1
Westford	5
Worcester	6
Blank	7
Total Respondents	**78 38.42%**

- One hundred twenty-five (125 or 61.58%) individuals indicated that they worked or travel to on a regular basis, a community within the Montachusett region.

- Of the remaining 78 responses, 38.42% indicated travel outside of the region. Seven (7) of those 78 left no response at all.

Question 3 - Are you …?

This question identified the respondent as a Municipal Employee, a Municipal Official (board member, etc.) or the General Public and allowed us to analyze answers based on their role within a community.

	Lived In Region - Worked In Region	Lived In Region - Worked Outside Region	Lived Outside Region - Worked In Region	Lived Outside Region - Worked Outside Region	Total Responses	Percent of Total
Municipal Employee	19	4	2	4	29	14.43%
Municipal Official	16	5	0	2	23	11.44%
General Public	87	52	8	2	149	74.13%
Totals	122	61	10	8	201	
Percent of Total	60.70%	30.35%	4.98%	3.98%		

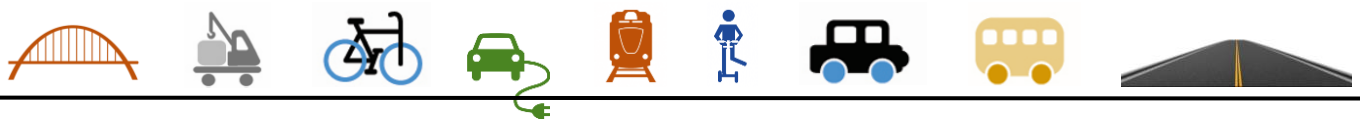
- Almost 61% of respondents both lived in and worked in the Montachusett region. Only 5% that lived outside of the region commuted into the region on a regular basis.
- Only two (2) individuals did not provide enough information to determine residence and/or place of work.
- In regards to MRPC communities, only four municipalities (Petersham, Phillipston, Royalston and Templeton) were not represented.

Question 4 - Rank in importance from 1 (Most) to 10 (Least), the following issues that need to be addressed in your **COMMUNITY** over the next 25 years.

This question provided respondents with 10 individual issues commonly faced by communities and asked them to rank them from 1, most important, to 10, least important. An opportunity to provide a different issue was also provided.

The ten issues were as follows:

- Road Maintenance & Infrastructure
- Transit Options
- Congestion
- Pedestrian & Bicycle Accessibility
- Safety – Road & Highway
- Economic Development
- Residential Development
- Climate Change & Environment
- Changing Demographics
- Improved Town Center



The following table summarizes the ranking of issues by the respondents based on their categorization as Municipal Employee, Municipal Official or General Public.

Table 5 - 6. RTP Survey Question 4 Summary

	RESPONDENT				Average Rank
	Municipal Employee	Municipal Official	General Public	All Respondents	All Respondents
1	Road Maintenance & Infrastructure	Road Maintenance & Infrastructure	Road Maintenance & Infrastructure	Road Maintenance & Infrastructure	2.76
2	Transit Options	Economic Development	Transit Options	Transit Options	4.61
3	Safety – Road & Highway	Safety – Road & Highway	Pedestrian & Bicycle Accessibility	Economic Development	4.65
4	Economic Development	Improved Town Center	Economic Development	*Pedestrian & Bicycle Accessibility*	*4.72*
5	Pedestrian & Bicycle Accessibility	Pedestrian & Bicycle Accessibility	Safety – Road & Highway	*Safety – Road & Highway*	*4.72*
6	Improved Town Center	Transit Options	Climate Change & Environment	Improved Town Center	5.80
7	Climate Change & Environment	Climate Change & Environment	Improved Town Center	Climate Change & Environment	5.95
8	Residential Development	Residential Development	Congestion	Residential Development	7.11
9	Changing Demographics	Congestion	Changing Demographics	Congestion	7.18
10	Congestion	Changing Demographics	Residential Development	Changing Demographics	7.32
11	Other (Rank)	Other (Rank)	Other (Rank)	Other (Rank)	9.05

Issues in Italics Represent a tie in their Ranking

- Road Maintenance & Infrastructure ranked first among all categories of respondents, i.e. Municipal Employee, Municipal Official and the General Public.
- The second highest ranked issue behind Roadway Maintenance & Infrastructure, had an average rank that was almost twice that of Road Maintenance & Infrastructure (4.61 compared to 2.76). This would indicate that among survey takers of the importance placed on the issue of Roadway Maintenance & Infrastructure.
- Transit Options ranked second in importance among the General Public and Municipal Employees. Surprisingly, among Municipal Officials, Transit Options fell all the way to sixth in importance.
- Safety – Road & Highway, Pedestrian & Bicycle Options and Economic Development all placed in the top five issues among each respondent group. Not surprisingly, Economic Development was a strong issue for Municipal Officials. It also placed high for the General Public, before Safety – Road & Highway.

- Among those respondents that replied with “Other” issues, their comments were examined and grouped based upon their perceived theme as follows:

Senior Issues
* Senior Housing, a Senior Center, a LGBT friendly community * Harvard is minimally invested in its Senior Citizens COA. We have NO Van of our own. Most importantly, we have NO VAN to take Seniors into Boston for medical appointments. This is vitally important, as all my doctors are in Boston. And their current arrangement to 'drop off' Seniors at a nearby town's rapid transit stop (Littleton) is hardly appropriate for seniors unable to navigate train stations and then walk to hail cabs! * Reliable van service for seniors * Senior housing opportunities

Mobility/Bicycle & Pedestrian Accessibility
* Community connections * As medical services become more and more dependent on independent travel, transportation is needed. * Recreation availability, in town transportation availability * We need busses for transportation * Transportation from rural communities to places they work, healthcare and education. This is extremely important for our area. * Bicycle safety on our roads * Sidewalks and bike lanes * I didn’t answer other. Climate concerns are real but secondary in this questionnaire. I would take a bus if i could. Or a train. Or a bike. Or walk.

Open Space/Historic Preservation
* Preservation of historic buildings and community fabric in the face of over-development and excessive automobile traffic Linked open space/ bike trails * Recreational opportunities and tourism * Protection from development near water supply, wetlands, and streams. Non-point source runoff. * Better protection for local waters, i.e. 1, replace culverts to meet DER standards for passage; 2, promote open space; 3, reduce road runoff/road salt * Acquisition of open space/multi-purpose trails, including equestrian access

Other
* Education * Population health/health equity/SDOH * Overall quality of life; viable food system; sense of belonging * Use of sand on roads during Winter whenever it snows needs to be abolished immediately as it causes dirt after the snow melts and clogs sewer/drainage systems. * Social and economic too many people living In poverty * Overall road safety is horrible. * Business/Industrial Park needs to be in the 20-year plan. Rezoning parcels on Route 12 and continuing the water supply in order to do this will be key to any economic future of the town. * Healthcare * Harvard is a town out of balance. Over 90% of property tax revenue goes to public schools run like private ones. Schools get all. Seniors are marginalized, severely underserved…..

Several of these issues can be categorized as applicable to the identified issues, i.e. Transit Options, Safety and Changing Demographics.

Question 5 - If you were in charge of allocating transportation funds for your **COMMUNITY** over the next 25 years, how would you invest or divide a budget of $100?

Question 5 then asked the respondents to monetarily rank improvement strategies by having them distribute a budget of $100 among the following:

- Road Maintenance & Infrastructure
- Transit Options
- Congestion Relief
- Pedestrian & Bicycle Facilities
- Safety (High Crash Locations)
- Complete Streets
- Community Access
- Regional Access
- Climate Change & Environment
- Other

For analysis purposes, results were broken down for MRPC member communities only. These were further separated into urban and rural communities based upon the character of the community and not along any federal census guidelines.

Table 5 - 7. RTP Survey Question 5 Urban vs Rural Communities

Montachusett Communities Urban vs Rural	
Rural	Urban
Ashburnham	Ayer
Ashby	Athol
Groton	Clinton
Harvard	Devens
Hubbardston	Fitchburg
Lancaster	Gardner
Petersham	Leominster
Shirley	Lunenburg
Sterling	
Townsend	
West Townsend	
Westminster	
Winchendon	

- Among rural communities, the top three funded strategies are consistent among the respondent type, i.e. Road Maintenance & infrastructure, Transit Options and Pedestrian & Bicycle Facilities. Road Maintenance average funding is more than double the next option, i.e. Transit or Bike & Ped Facilities.

- Of the top five strategies, the only difference between Municipal respondents and the General Public is at number 4 and 5. The Public puts more emphasis on Climate Change and Safety while Municipals rank Complete Streets and Climate Change over Safety.
- For urban communities, all respondents list in their top four strategies Road Maintenance & Infrastructure, Transit Options, Safety and Pedestrian & Bicycle Facilities in one order or another. The only difference in strategy rankings occur with the fifth ranked issue; Congestion Relief for Municipals and Regional Access for the General Public. and Congestion Relief. In both instances, Road Maintenance average costs is more than double the next highest strategy.
- Not surprisingly, Congestion Relief and Regional Access are more important issues to the Urban municipalities.
- When the entire Region is examined, the top three strategies remain Road Maintenance & Infrastructure, Transit Options and Pedestrian & Bicycle Facilities with Road Maintenance again garnering more than twice the dollars as strategy number two.

Table 5 - 8. RTP Survey Question 5 Summary

	Funds Per Strategy Municipal Employees & Officials Rural MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$47.71
2	Pedestrian & Bicycle Facilities	$14.83
3	Transit Options	$9.17
4	Complete Streets	$6.02
5	Climate Change & Environment	$5.54
6	Safety (High Crash Locations)	$4.78
7	Regional Access	$4.58
8	Community Access	$3.27
9	Other (Please Explain)	$2.59
10	Congestion Relief	$1.51

	Funds Per Strategy Municipal Employees & Officials Urban MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$47.67
2	Transit Options	$11.87
3	Safety (High Crash Locations)	$7.33
4	Pedestrian & Bicycle Facilities	$6.80
5	Congestion Relief	$6.00
6	Climate Change & Environment	$5.33
7	Complete Streets	$4.73
8	Regional Access	$4.27
9	Other (Please Explain)	$3.67
10	Community Access	$2.33

	Funds Per Strategy Municipal Employees & Officials MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$47.69
2	Pedestrian & Bicycle Facilities	$11.82
3	Transit Options	$10.18
4	Safety (High Crash Locations)	$5.74
5	Complete Streets	$5.54
6	Climate Change & Environment	$5.46
7	Regional Access	$4.46
8	Congestion Relief	$3.19
9	Other (Please Explain)	$2.99
10	Community Access	$2.92

	Funds Per Strategy General Public Rural MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$34.48
2	Transit Options	$16.44
3	Pedestrian & Bicycle Facilities	$14.01
4	Climate Change & Environment	$8.56
5	Safety (High Crash Locations)	$7.02
6	Congestion Relief	$5.17
7	Complete Streets	$4.14
8	Regional Access	$4.01
9	Community Access	$3.83
10	Other (Please Explain)	$2.33

	Funds Per Strategy General Public Urban MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$31.14
2	Pedestrian & Bicycle Facilities	$13.52
3	Transit Options	$13.27
4	Safety (High Crash Locations)	$10.09
5	Regional Access	$7.70
6	Congestion Relief	$7.36
7	Complete Streets	$6.82
8	Climate Change & Environment	$5.41
9	Community Access	$4.68
10	Other (Please Explain)	$0.00

	Funds Per Strategy General Public MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$33.91
2	Transit Options	$15.90
3	Pedestrian & Bicycle Facilities	$13.92
4	Climate Change & Environment	$8.02
5	Safety (High Crash Locations)	$7.55
6	Congestion Relief	$5.54
7	Regional Access	$4.64
8	Complete Streets	$4.60
9	Community Access	$3.98
10	Other (Please Explain)	$1.93

Table 5 - 8. RTP Survey Question 5 Summary (continued)

	Funds Per Strategy All Respondents Rural MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$37.00
2	Transit Options	$15.06
3	Pedestrian & Bicycle Facilities	$14.16
4	Climate Change & Environment	$7.98
5	Safety (High Crash Locations)	$6.60
6	Complete Streets	$4.50
7	Congestion Relief	$4.47
8	Regional Access	$4.12
9	Community Access	$3.73
10	Other (Please Explain)	$2.38

	Funds Per Strategy All Respondents Urban MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$37.84
2	Transit Options	$12.70
3	Pedestrian & Bicycle Facilities	$10.80
4	Safety (High Crash Locations)	$8.97
5	Congestion Relief	$6.81
6	Regional Access	$6.31
7	Complete Streets	$5.97
8	Climate Change & Environment	$5.38
9	Community Access	$3.73
10	Other (Please Explain)	$1.49

	Funds Per Strategy All Respondents MRPC Communities Only	Avg $
1	Road Maintenance & Infrastructure	$37.19
2	Transit Options	$14.54
3	Pedestrian & Bicycle Facilities	$13.43
4	Climate Change & Environment	$7.41
5	Safety (High Crash Locations)	$7.12
6	Congestion Relief	$4.98
7	Complete Streets	$4.82
8	Regional Access	$4.60
9	Community Access	$3.73
10	Other (Please Explain)	$2.18

- Several respondents entered funding under the Other strategy box of Question 5. However, many of the explanation identified an address with no other description to indicate what type of issue or strategy would be applicable. These responses were therefore not categorized in the analysis. Fourteen (14) respondents did indicate a particular strategy with their comment. These comments were summarized between Rural and Urban MRPC communities and are listed below. With each comment, an attempt was made to identify one or more of the existing strategies that might effectively address the concern listed. In a few cases, a new or different issue was identified requiring consideration of a possible new improvement strategy. Two in particular were Tourism and Stormwater Runoff. However, the strategies of Community and Regional Access as well as Climate Change have the potential to provide benefits to these identified issues.

Table 5 - 9. RTP Survey Question 5 Comment Summary

RURAL - MRPC Region Only

Community	Comment	Applicable Strategy
Municipal Employees & Officials		
Harvard	Sidewalks and trails	Pedestrian & Bicycle Facilities
Townsend	Sidewalks	Pedestrian & Bicycle Facilities
General Public		
Ashburnham	Commuter rail service	Transit Options
Harvard	Availability for independent travel for medical needs, other individual needs $50	Transit Options; Community & Regional Access
Harvard	$100 to the COA for a van that can travel into Boston	Transit Options; Community & Regional Access
Shirley	Turn the rail line, in Ayer, heading to West Groton into a road. This will relieve traffic on Lawton Road & 111 (past Tiny's); Add a Market Basket to Devens	Community & Regional Access
Townsend	Connecting towns together by trails - bike / walking	Pedestrian & Bicycle Facilities
Townsend	Decrease pollution/climate change and congestion by improving bike and pedestrian access.	Pedestrian & Bicycle Facilities; Climate Change & Environment
Townsend	Explore better town management systems	Local Management
Winchendon	Tourism & Recreation	Tourism; Recreation

URBAN - MRPC Region Only

Community	Comment	Applicable Strategy
Municipal Employees & Officials		
Fitchburg	Use people and fundraisers for many projects. Charge permits for using the rail trail. Put more police officers out in high crash locations. Try earning money for projects instead of taking money ahead of time.	Local Management; Safety (High Crash Locations)
Gardner	Stormwater Infrastructure	Stormwater; Climate Change & Environment
Lunenburg	Stormwater; keeping it off the roads and keeping it from flooding our roadways and polluting our waters	Stormwater; Climate Change & Environment
General Public		
Fitchburg	Access to Route 2	Community & Regional Access

Question 6 - Looking forward 25 years, what do you think **WOULD BEST DESCRIBE YOUR COMMUNITY** in 2045?

This question attempts to determine how residents perceive their community currently and, in the future, based on current trends and patterns.

Table 5 – 10. Question 6 Responses – Rural, Urban and All Montachusett Communities

		Residential/ Bedroom Community	Strong Commercial Community	Strong Industrial/ Manufacturing Community	Mixed Use Community	Growing Community	Stagnant Community	In Decline Community	Other
RURAL	A Municipal Employee	11	0	0	5	4	1	0	0
	A Municipal Official	9	0	0	6	4	5	2	2
	General Public	84	2	1	24	29	22	9	4
	Total Rural Responses	143							
URBAN	A Municipal Employee	2	2	2	6	3	0	0	0
	A Municipal Official	3	1	0	3	2	2	0	1
	General Public	8	4	6	15	11	6	2	1
	Total Urban Responses	40							
All MRPC Communities	A Municipal Employee	13	2	2	11	7	1	0	0
	A Municipal Official	12	1	0	9	6	7	2	3
	General Public	92	6	7	39	40	28	11	5
	Total All Responses	183							

Figure 5 - 2. Question 6 - Montachusett Rural Communities Only

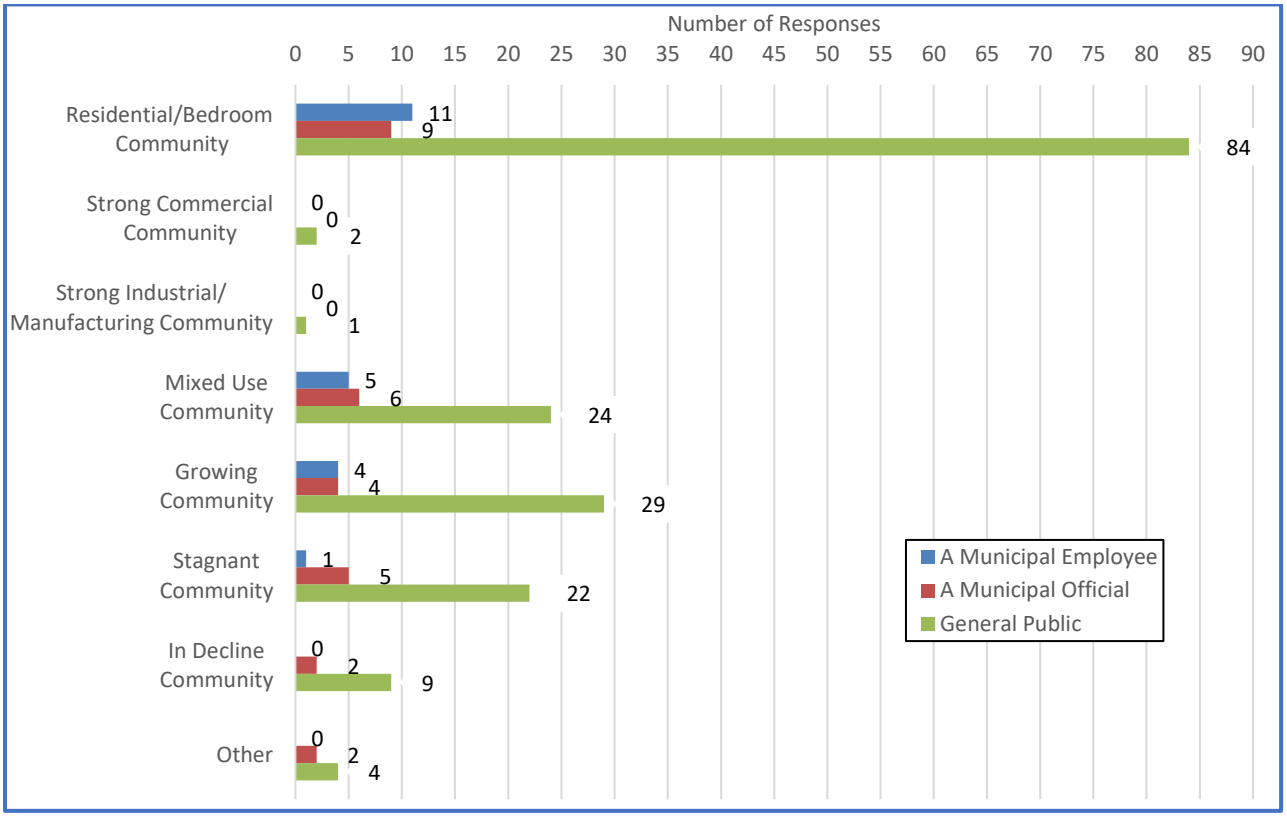


Figure 5 - 3. Question 6 - Montachusett Urban Communities Only

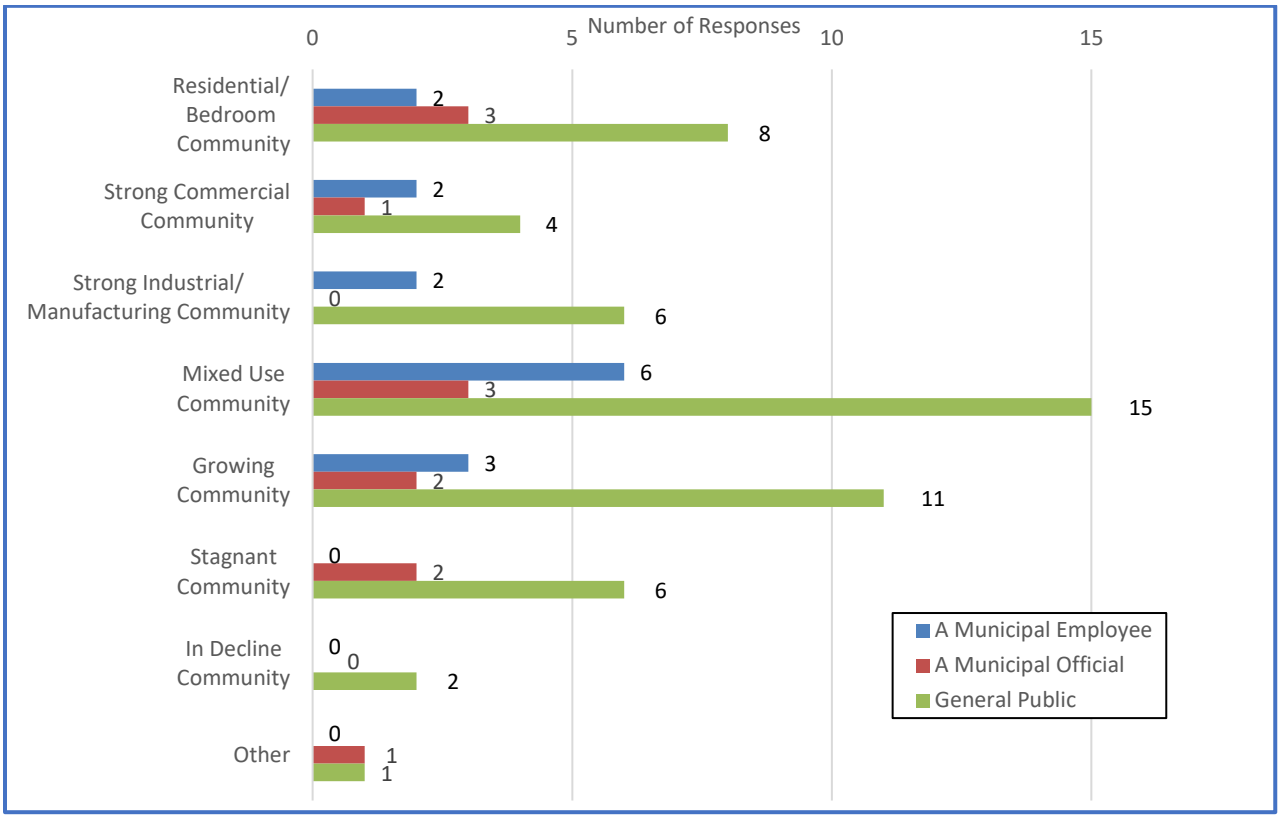


Figure 5 - 4. Question 6 - Montachusett All (Rural & Urban) Communities

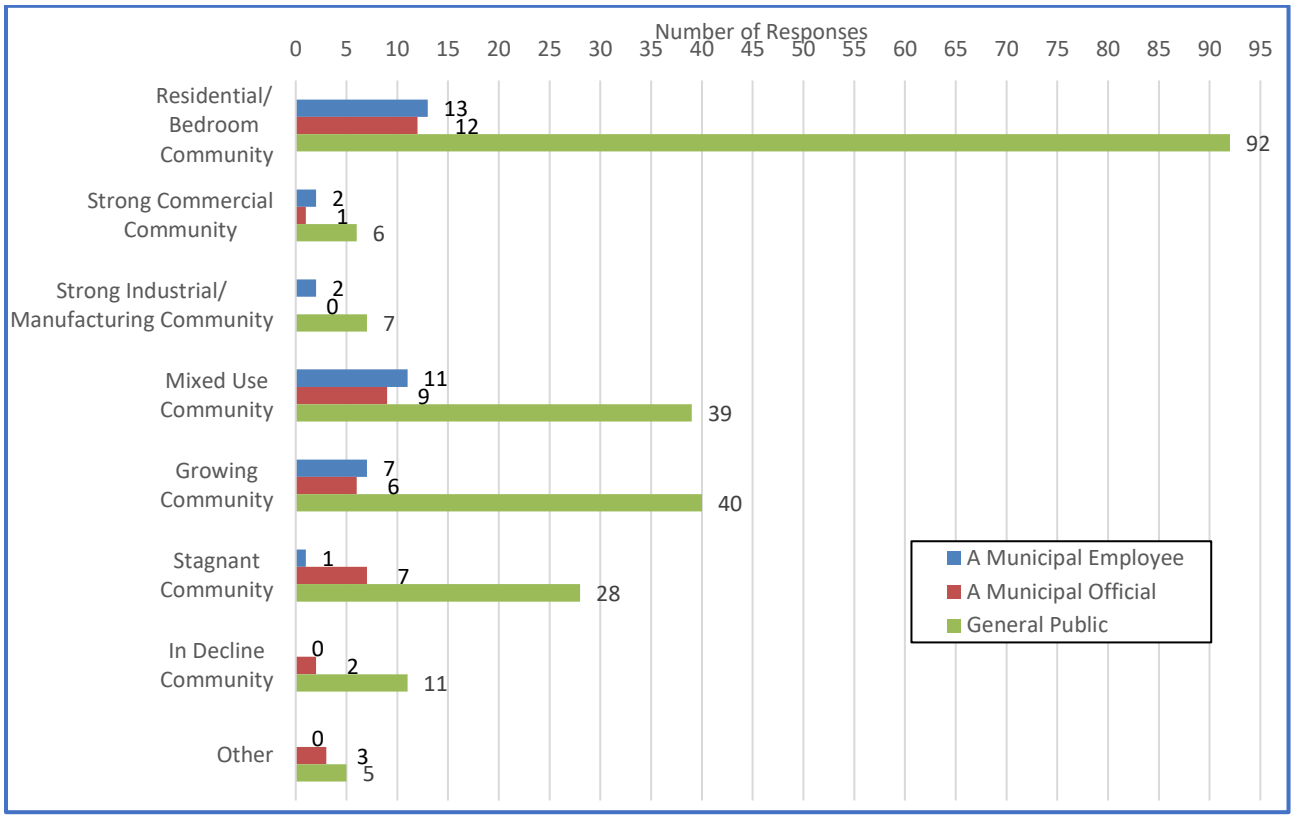


Table 5 – 11. Question 6 Other Comments

Rural		
Harvard	Municipal Official	Sustainable, rural, smart agritourism community w/return of jurisdiction of Devens as economic base diversifier/engine.
Hubbardston	Municipal Official	I think the population will continue to grow slightly but the school age population has declined sharply and is likely to continue to, unless we can attract young families.
Harvard	General Public	Seeking senior housing and business development.
Harvard	General Public	Poorly governed town, run by insiders and those with an agenda. People move here for schools only, care about themselves & not the whole town. They are affluent and entitled. Not invested in this place, they leave after kids graduate. Leaving long term school dept behind. Harvard's Seniors are underserved and devalued.
Harvard	General Public	Rural residential - low key industry - way more trees than people. Keep it rural.
Winchendon	General Public	If little changes, a stagnant community with lots of aspirations, but not quite succeeding.

Urban		
Lunenburg	Municipal Official	Farming, hopefully
Fitchburg	General Public	Clean and desirable living environment with good infrastructure and public amenities like parks. Good schools.

- The majority of respondents whether municipal employees, officials or general public view their communities as a Residential/Bedroom Community.

- Few respondents considered their municipalities as a Strong Commercial Community whether Urban or Rural.
- An equal number of Urban and Rural respondents, 15% in each case, consider their community as stagnant with 5 to 6% categorizing their community as In Decline.
- On the other hand, 20% of Rural respondents listed their community as Growing. For Urban respondents this number increases to 27%.
- Those that responded under Other, listed generally positive items about their towns but with concerns for future growth due to changing demographics and the need for some diversification in the town image or base.

Question 7 - Looking forward 25 years, how **WOULD YOU LIKE YOUR COMMUNITY TO BE DESCRIBED** in 2045?

Question 7 seeks to assess how individuals would like their particular community to be described or perceived in 2045. Based upon the responses, an indication of the type of growth is preferred in the region.

Table 5 – 12. Question 7 Summary

		Residential/ Bedroom Community	Commercial Community	Industrial/ Manufacturing Community	Mixed Use Community	Growing Community	Up & Coming Community	Other
RURAL	A Municipal Employee	6	0	0	4	5	1	1
	A Municipal Official	6	1	1	6	4	5	3
	General Public	51	3	1	49	44	33	10
	Total Rural Responses	143						
URBAN	A Municipal Employee	1	1	1	2	6	1	1
	A Municipal Official	2	0	1	4	4	3	1
	General Public	3	4	3	17	16	9	2
	Total Urban Responses	40						
All MRPC Communities	A Municipal Employee	7	1	1	6	11	2	2
	A Municipal Official	8	1	2	10	8	8	4
	General Public	91	43	41	89	84	73	50
	Total Rural Responses	183						

Figure 5 - 5. Question 7 - Montachusett Rural Communities Only

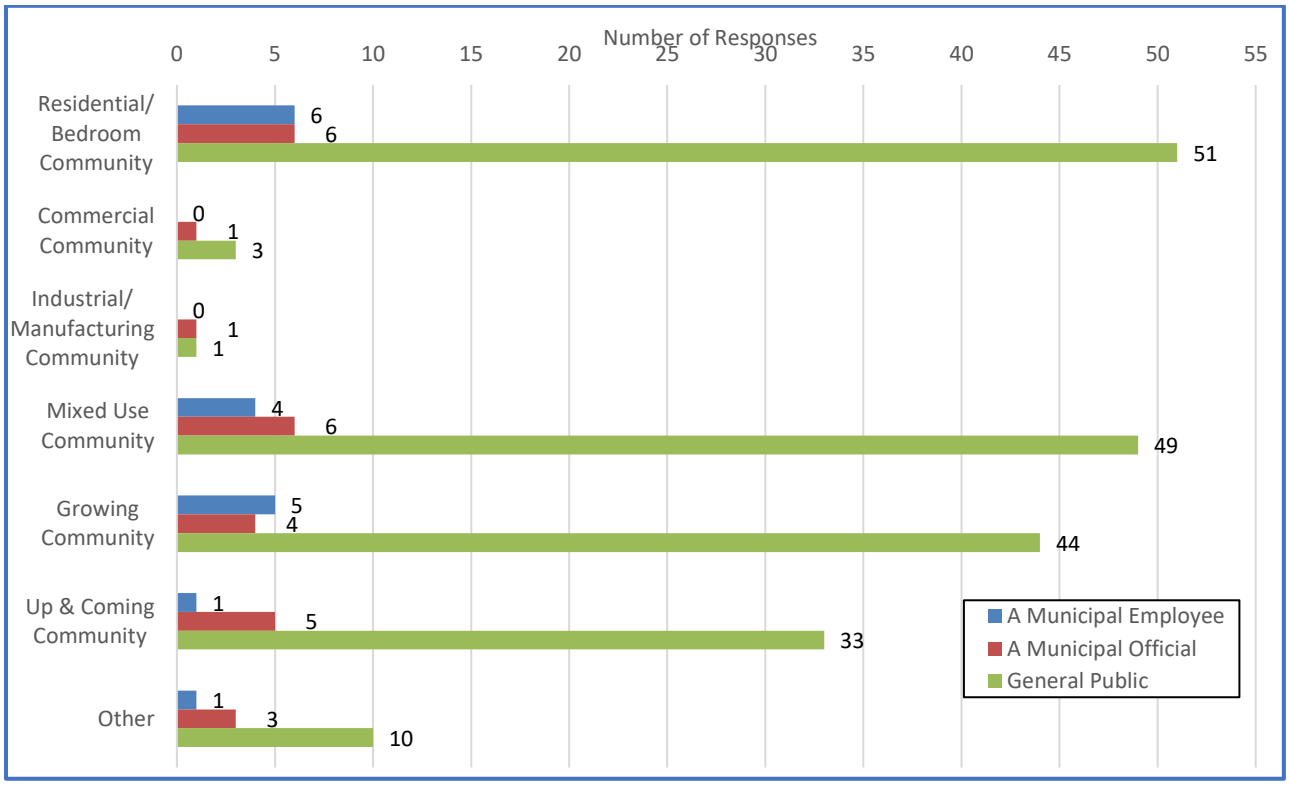


Figure 5 - 6. Question 7 - Montachusett Urban Communities Only

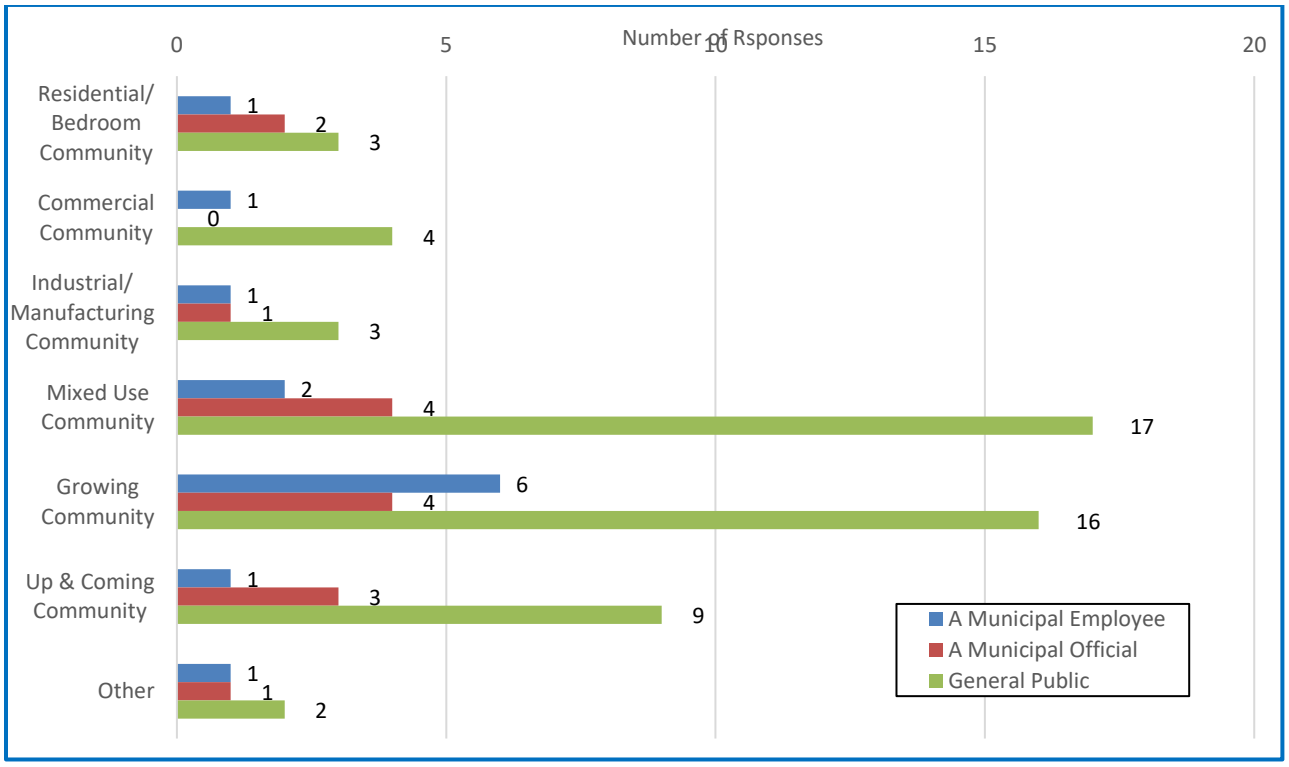


Figure 5 - 7. Question 7 - Montachusett All (Rural & Urban) Communities

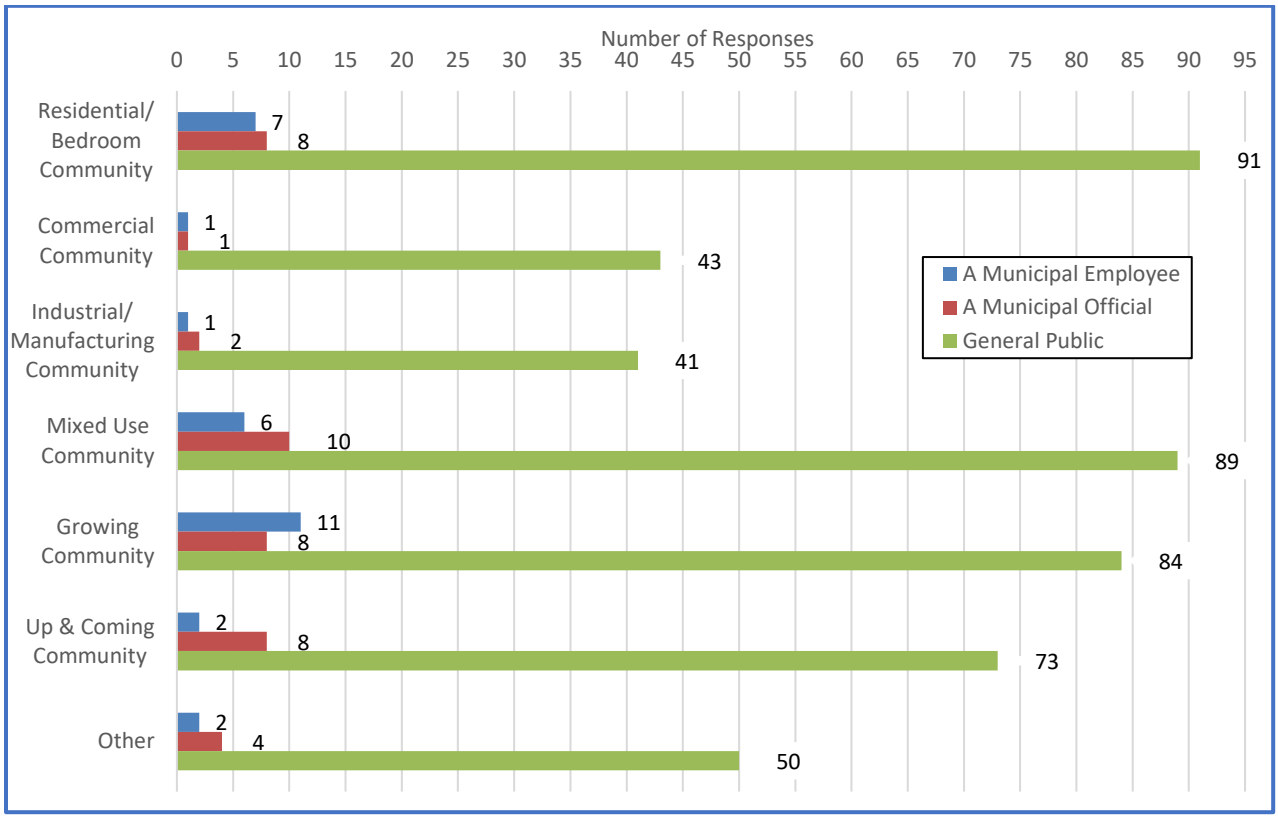


Table 5 – 13. Question 7 Other Comments

Rural		
Groton	Municipal Employee	A residential community with housing available to all demographic types and needs while preserving environmental diversity and habitat
Harvard	Municipal Official	Up & coming bc it has planned for future development ie managed growth impacts like traffic, values rural, sustainable growth, retains its natural beauty & resources, supports strong schools, regains Devens to financially support smart growth policies.
Hubbardston	Municipal Official	Regional tourist destination for outdoor recreation
Lancaster	Municipal Official	A turn around to ethical and improved government integrity
Ashburnham	General Public	Part of a region wide network supporting local Ag, small businesses and micro grids for energy
Ashburnham	General Public	Quiet rural alternative to suburbia
Ashby	General Public	Resilient, 50% Art. 97 protected open space
Groton	General Public	Sustainable, Accessible, Pedestrian & Bike Friendly
Groton	General Public	Arts & recreation destination
Harvard	General Public	A Senior friendly community with outstanding public schools.
Harvard	General Public	Rural residential with as much open space and nature as possible.
Harvard	General Public	Stable community
Harvard	General Public	Conservation-minded leading by example community
West Townsend	General Public	Townsend - a friendly town that has lots of open space, supports it elderly, veterans, schools and local churches AND continues its charm with Summer Band Concerts on the Common!

Table 5 – 13. Question 7 Other Comments (continued)

Urban		
Fitchburg	Municipal Employee	Well balanced
Lunenburg	Municipal Official	Farming, hopefully
Fitchburg	General Public	Improved socioeconomic
Leominster	General Public	Green community including transportation

- Thirty to 35 % of Rural General Public respondents indicated that they would like their communities to remain or be considered as a Residential/Bedroom Community, Mixed Use Community or an Up and Coming Community.
- The number of Rural General Public respondents that want to see their community considered a Mixed-Use Community in 2045 was more than double the number that currently consider their town as Mixed Use.
- In terms of All respondents, the number that wished to have their community considered Growing in 2045 was also more than double the number who responded with the same description under Question 6.
- In comparison to Question 6, it appears that most respondents would like to see a growth in their community with less emphasis on Residential and more on Mixed Use.

Question 8 - Comments/Recommendations

Question 8 was an opened ended question that let respondents identify other key issues or to expand upon points made or discussed in the survey. All responses were reviewed and grouped together based upon a perceived common thread. The following tables highlight these comments.

Table 5 – 14. Question 8 Other Comments

Senior Issues
Rural
- Transportation options for seniors and disabled is the number ONE issue we deal with. - Seniors need services or we will lose them! - In Harvard ... concerned about getting around town… to services in nearby towns when I have to give up driving ... - Need better senior housing opportunities and better van or other transportation opportunities for seniors - Senior transit and housing
Response: Accessibility for seniors remains a key issue throughout the Region. Planning activities will continue to examine these problems and attempt to develop strategies to address. Future updates to the Coordinated Public Transit - Human Services Transportation Plan will address issue directly. Further information will be provided to MART as they continue to monitor services directly related to seniors.

Mobility/Transit Options
Rural
- Groton needs bus and other shared ride options. - ...more should be done so that people can work in the community that they live in and not have to commute 30-60 miles away ... to work. Ideally, people should be able to walk or bike to work - We need more travel options in and out of town. - Help with access to highways/jobs. 20 minutes to highways means no younger home buyers which leads to aging and stagnation - ... if we devote more resources to mass transportation, bicycle and pedestrian travel, that should help reduce single-occupant automobile traffic - We need better access to Rt 2 whether by highway or train. - Enhance access to the commuter rail for residents of neighboring communities. ... a shuttle twice a day from Harvard to the Ayer, Littleton, or South Acton stations. - Harvard needs transit options for all citizens to save the environment and give non-drivers quality of life - Need to broaden accessibility of transportation systems including vac services for seniors and disabled - Must help improve the quality of life by reducing the commute to Boston/ inside 495 - As a very rural area...most accommodations at least 8-10 miles away... need for transportation for...less fortunate population is a must...While...buses are available, the schedule is nearly non-existent, and that could easily be changed. - Fixed the commuter rail. The congestion and wider region transit goals cannot be met without a strong and vibrant mass transit option to Boston.
Urban
- We need to link Leominster MART and Worcester WRTA! The WRTA Route 30 and Leominster Jytek link! - I believe we should continue to work to improve transportation infrastructure within our region, especially long distance trails and bike path/greenways (not emphasized in this survey). However, I believe we also need to advocate strongly for improvements to Route 2 through Concord to eliminate that "bottleneck" congestion problem associated with the rotary and cross-traffic. It is long overdue and affects thousands of commuters from this region each day. While this is outside of our region, I believe it is important to the social, cultural, and economic success of the Montachusett Region. - Use riverway and rail lines for accessible trails coupled with transit. On road routes should be barrier-protected.
Response: - Information will be provided to MART and staff will continue planning work with the Transit Authority on improved services to outlying communities. In addition, expansion of shuttle services continues to be a focus of MART. - Bicycle and pedestrian issues to be addressed within upcoming Regional Bike and Pedestrian Plans.

Table 5 – 14. Question 8 Other Comments (continued)

Bicycle & Pedestrian Accessibility
Rural
- Making Townsend walkable - both pedestrian and hiking - would be great. - The more we make our communities walkable and bikeable, the better life will be in them. - …would love more sidewalks and sidewalk to bike path/long-distance mixed-use trail connections. Once you are home, you should be able to take a safe walk through your community. - Being able to get around rt 119 on a bicycle is key for me. Plus, more protected land around the watershed. - Plant more trees downtown; include bicycle lane on roads
Response: Bicycle and pedestrian issues to be addressed within upcoming Regional Bike and Pedestrian Plans.

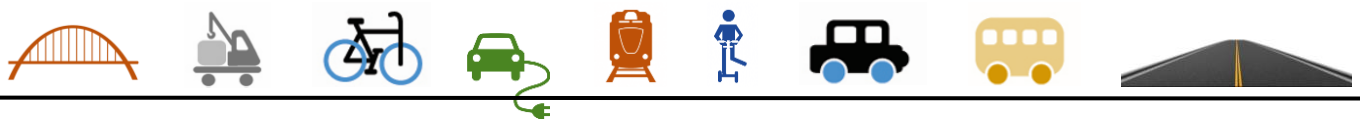
Other
Rural
- Tree removal at roadsides where they interfere with power lines if they fall...they loom dangerously over...roads. - less development; more land conservation and historic preservation. - Ashburnham does not do something to rein in spending... the current lack of upkeep on infrastructure will...lead to unnecessary spending...roads... just paved in last 5 years...already showing signs of breakdown because crack-sealing has never been a priority. The DPW needs ...resource management software. - Education is number 1 in importance...to support this, the community needs to grow in population and in industry and commerce. - The Town needs to do better on maintaining their facilities. - With the population decreasing, we need to adapt our schools' systems, transportation and tax base. - ...town of Harvard is losing its younger population due to costly real estate, taxes, low commercial development... As a result, the retired older pop. is footing more and more of the tax burden thus forcing them to consider…leaving. - I would like to see it more as a diverse community that invests in keeping people as they age by meeting their needs such as a strong COA, housing options that prevent isolation, down to simple things such as level walking paths. - More commercial entities. - Increased traffic pressure from outside Harvard and the growing concern for safety and speed limit enforcement have the potential to dramatically impact safety and lessen the enjoyment of the rural qualities of our town for everyone. - There needs to be more retail in our area. A large scale build up would increase foot-traffic and raise housing prices. Also, our schools would improve. - Open space is paramount to keeping 01469 a bedroom place forever - Town and State groups more closely together. Maybe forums set quarterly around the state to meet with groups of towns on transportation issues to obtain a broader perspective on where the citizens would like us to move. - If we don't start working on climate change, we won't have a future to worry about. - Townsend does not have enough local business for tax support. A lot of the burden of infrastructure improvements lay on the tax payers. This does not lead to positive feedback from the community when trying to enact positive changes for the future of the town. - More work needs to be done to develop an across-community regional identity for North Central MA.
Urban
- Describe Fitchburg in next 10 years as Fitchburg as regional destination for arts and culture with a strong mixed-use portfolio- it is a vibrant hub to an integrated transportation system

Trends

Through the public outreach process, a number of issues and recommendations were brought forward, either as a direct comment or through plan development and analysis.

The following summarizes the trends discussed through these various meetings and plans. For a more detailed discussion, please contact the MRPC for further information.

- A need for infrastructure improvements to existing facilities as well as potential expansion projects to improve efficiency;
- Environmental issues related to state highways are need to improve issues such as water quality;
- The expansion and development of trails have shown various benefits to the region from economics to health;
- The Complete Streets program and funding opportunities has been embraced by communities;
- Chapter 90 funding levels continue to be a problem for local communities, especially smaller, more rural municipalities;
- Project costs as well as the overall process continue to be an issue;
- Recreational opportunities in the region are a strength to be promoted;
- The quality of the regions educational systems is a strength that should also be promoted;
- The quality of the transportation infrastructure is seen as a weakness from the business and local official perspective;
- The quality of the public transportation system is also seen as a weakness;
- Public transportation is seen as a viable option when and where available, however, reliability, cost effectiveness and operating schedules are major factors affecting their use by students, elderly and disabled individuals.
- Company run shuttles are also seen as an attractive option for employees;



- There is a general consensus that local knowledge of the transit system and all of its available options is a major reason for a lack of use;
- Transportation issues are a major barrier to accessing health care, jobs, social services and healthy foods;
- Prioritize regional target funding to the following categories:
    a. Road Maintenance & Infrastructure
    b. Transit Options
    c. Pedestrian & Bicycle Facilities
    d. Climate Change & Environment
    e. Safety (High Crash Locations)
    f. Congestion Relief
    g. Complete Streets
    h. Regional Access
    i. Community Access

Recommendations

The following is a list of recommendations compiled through the public input process. In many cases, a specific location was identified as a trouble spot or issue. These specific projects, unless considered "Regionally Significant", are not necessarily identified with or tied to a specific funding year in this RTP. Rather, general programming funding areas, i.e. pavement reconstruction, trail development/construction, etc., are assumed to cover these projects. Any "Regionally Significant" projects that can be reasonably expected to move forward in this RTP time frame are, however, identified.

- Rt 2/South Athol Road interchange construction;
- Mt Elam Road at Route 2 – removal of traffic signal and stormwater run-off mitigation;
- Route 12 corridor in Fitchburg;
- Twin Cities Rail Trail to the Mass Central Rail Trail;
- North Central Pathway into Ashburnham and points west;
- Devens trail connections to Harvard (Old Mill Road) and the Ayer rotary area;
- North Central Pathway connection to Monadnock region;
- Complete streets - More funding for local community projects;
- Park & Ride lots expansion along the Route 2 corridor;
- Chapter 90 funding increase for local projects and needs;
- Improve MART's communication and advertisement of bus and transit services;
- Support and expand Collaborative Workspaces in the Montachusett Region. Makerspaces, along with co-working spaces and business incubators can improve and increase businesses. They can also support the development of new skills.
- Expand the designation of Opportunity Zones. This poses a potential economic opportunity by providing tax incentives to invest in distressed communities;
- Continue and increase promoting transit and commuter rail options;
- Restructure existing transit service options in North Central to better align with the needs of current and prospective consumers.
- Promote the need for more COA vans.

6 Transportation Equity

TRANSPORTATION EQUITY

Transportation and social equity, Title VI and Environmental Justice all play a key role in the quality of life in the region by shaping access to jobs, housing, services and recreational opportunities and is essential to addressing poverty, unemployment and other equal opportunity goals. **Transportation and social equity** is a civil and human rights priority and major goal for the Montachusett Region. It requires making investments that provide all residents - regardless of age, race, color, national origin, income or physical agility - with opportunities to work, shop, be healthy, and play.

Title VI was enacted as part of the landmark Civil Rights Act of 1964 and prohibits discrimination on the basis of race, color, sex and national origin in programs and activities receiving federal financial assistance. In 1994, Executive Order 12898 was issued by President Clinton. Its purpose is to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The order is also intended to promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities' access to public information and public participation. The order also directs each agency to develop a strategy for implementing environmental justice.

The Executive Order 552 was issued on November 25th, 2014 requiring Secretariats to take action in promoting environmental justice (EJ). "**Environmental Justice** is based on the principle that all people have a right to be protected from environmental pollution, and to live in and enjoy a clean and healthful environment. Environmental justice is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits" (www.mass.gov) . In Massachusetts a community is recognized as an Environmental Justice community if any of the following are true:

- Block group whose annual median household income is equal to or less than 65 percent of the statewide median; or
- 25% or more of the residents identifying as minority; or
- 25% or more of households having no one over the age of 14 who speaks English only or very well - Limited English Proficiency (LEP)

EJ neighborhoods where more than one criterion is met may be at an even greater risk of exposure to environmental and health hazards.

There are 54 identified EJ areas within the Montachusett Region – identified through the 2010 Census – representing 72,624 residents (approximately 31% of total Montachusett residents in 2010). 32 of Montachusett EJ areas have low-income designation: 14 are EJ-designated due to income alone, 17 also have high minority populations, and one EJ area is due to high numbers of minority, non-English speaking as well as low-income residents. The additional 22 areas received EJ designation due to a high proportion of minority residents; these are predominantly located in Fitchburg (10) and Leominster (7), along the Route 2 Corridor.

In 2000, Executive Order 13166 was issued "Improving Access to Services for Persons with Limited English Proficiency". The Executive Order requires Federal agencies to examine the services they provide, identify any need for services to those with limited English proficiency (LEP), and develop and implement a system to provide those services so LEP persons can have meaningful access to them.

Target Populations

The target populations used for the Transportation Equity Analysis include:

a) Elderly
b) Individuals with Disabilities
c) Minority
d) Foreign Born
e) Language
f) Low Income

Detailed information for these populations can be found in the Demographic section of this document.

Target Communities

To conduct a social equity analysis, it is necessary to identify people who are vulnerable or disadvantaged. Target communities within the Montachusett Region were communities that exceeded the regional average for any of the target populations listed below (also see the maps located at the end of this chapter).

a) Elderly (% of Total Population > 65 that is higher than the regional average of 15.11%) – Athol, Gardner, Harvard, Lancaster, Leominster, Lunenburg, Petersham, Royalston, Sterling, Templeton, Westminster and Winchendon
b) Individuals with Disabilities (% of population with a disability that is higher than the regional average of 12.03%) – Athol, Fitchburg, Gardner, Leominster, Petersham, Phillipston, Royalston and Winchendon
c) Minority (% of population that is considered non-white and is higher than the regional average of 12.24%) – Ashburnham, Ayer, Fitchburg, Harvard, Leominster and Shirley
d) Foreign Born (% of population that is Foreign Born and is higher than the regional average of 8.12%) – Ayer, Clinton, Fitchburg, Harvard, Leominster and Shirley
e) Language (% of Population Spoken Language Other than English that is higher than the regional average of 14.42%) – Clinton, Fitchburg, Leominster, and Shirley
f) Low Income (% Estimated Below Poverty Level that is higher than the regional average of 10.85%) - Athol, Ayer, Fitchburg, Gardner, Leominster, and Winchendon

Highway - Past Projects

To conduct a review of past highway transportation projects within the region and their potential impact on the target populations and communities, projects that were listed on the most recent MPO Endorsed FFY2020-2024 Transportation Improvement Program (TIP) were analyzed. This analysis is broken into two parts. The first is an examination of federal target eligible projects

contained within this TIP, i.e. FFY 2020-2024. The second involves a five year "look back" at prior TIP projects. For this analysis that would include projects from FFY 2015 to 2019.

Methodology

Projects identified for the two analyses include site specific projects, i.e. bridge replacements/rehabilitations and intersection improvements, as well as road and highway segments that may stretch several miles and across multiple communities. The identified projects were then mapped for each analysis against identified Environmental Justice (EJ) and/or Title VI populations. Staff then assessed the project locations relative to the identified populations.

For each of these analyses, the 2013-2017 American Community Survey 5-year estimates were utilized. All applicable maps can be found in the appendix of this document. For some of the data, census estimates were only available at the Census Tract level. This data dealt with Foreign Born, Disabilities and Non-English Spoken at Home populations. The remaining census data estimates were available at the Block Group level. The tables below list the ACS data sources as well as whether they were broken down to the Census Tract or Block Group level. These tables, therefore, were used to determine Environmental Justice and Title VI designated areas.

Table 6-1: 2013-2017 ACS 5-Year Estimates
By Block Group

Variable	2013-2017 ACS Table No.
Total Population	B03002
Majority Population	B03002
Poverty Determined Population	B17021
Below Poverty Population	B17021
Population 65 Years or Older Population	B09020
Median Household Income	B19013
Limited English Proficiency (LEP) Households	C16002

Table 6-2: 2013-2017 ACS 5-Year Estimates
By Census Tract

Variable	2013-2017 ACS Table No.
Total Population	B05002
Foreign Born	B05002
Individuals with Disabilities	S1810
Percent Household Limited English Proficiency (LEP)	S1602
Percent Language Spoken at Home – Non-English	DP02

Environmental Justice (EJ) and Title VI populations are defined differently by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). In addition, EJ analysis is based on different criteria, ex. poverty based on the statewide median income rather than the regional median income. The tables below define the Title VI and EJ criteria utilized in the regional analysis.

Table 6-3: Environmental Justice and Title VI Definitions for Analysis

Environmental Justice Block Groups	Analysis Criteria
1. Block group whose annual median household income is equal to or less than 65 percent (%) of the statewide median ($74,167 in 2017);	Statewide Median Income: $74,167 65% of Median Household Income: ***$48,209*** Geography: ***Block Group***
2. Twenty-five percent (25%) or more of the residents identifying as minority;	Minority Population Equal or Greater Than ***25%*** Geography: ***Block Group***
3. Twenty-five percent (25%) or more of the households having no one over the age of 14 who speaks English as their primary language or have a limited ability to read, speak, write, or understand English - Limited English Proficiency (LEP).	Limited English Proficiency Equal or Greater Than ***25%*** Geography: ***Block Group***

FTA Title VI Communities	Analysis Criteria
1. Minority – Percent of population including Hispanic or Latino of any race that is considered non-white and is higher than the regional average	Regional Average: ***12.24%*** Geography: ***Block Group***
2. Low Income - Percent estimated below poverty level that is higher than the regional average	Regional Average: ***10.85%*** Geography: ***Block Group***

FHWA Title VI Communities	Analysis Criteria
1. Elderly – Percent of Total Population > 65 that is higher than the regional average	Regional Average: ***15.11%*** Geography: ***Block Group***
2. Individuals with Disabilities – Percent of population with a disability that is higher than the regional average	Regional Average: ***12.03%*** Geography: ***Census Tract***
3. Minority – Percent of population including Hispanic or Latino of any race that is considered non-white and is higher than the regional average	Regional Average: ***12.24%*** Geography: ***Block Group***
4. Foreign Born – Percent of population that is Foreign Born and is higher than the regional average	Regional Average: ***8.12%*** Geography: ***Census Tract***
5. Language – Percent of Population Spoken Language Other than English that is higher than the regional average	Regional Average: ***14.42%*** Geography: ***Census Tract***

FFY 2020-2024 Target Eligible Projects

To assess the possible benefits or burdens of the projects within the FFY 2020-2024 TIP, those projects identified as federal aid target eligible were identified. The analysis for this TIP is limited to these projects as they are the projects with the most programming control of the MPO. Bridge projects as well as those on the Interstate system, etc., are prioritized at the state level.

The following table identifies 24 target eligible projects in the Montachusett Region, listed by their calculated TEC score as well as their anticipated FFY year listing for this TIP. Some of the projects are identified as being listed in the Appendix of the TIP. The Appendix is a listing of projects without an identified funding source or program year due to design status and/or fiscal constraint issues.

Table 6-4: FFY 2020-2024 Target Eligible Projects

TIP Year	MassDOT ID #	Community	Description	TEC	Est Cost FFY 2020 Dollars
2020	605651	Leominster	Leominster- Reconstruction on Route 13, From Hawes Street to Prospect Street	46	$5,994,626
2020	607902	Ayer	Ayer- Reclamation & Related Work on Route 2A, from Harvard Road to Main Street	32	$3,837,875
2021	608779	Lancaster	Lancaster- Intersection Improvements on Route 117/Route 70 at Lunenburg Road and Route 117/Route 70 at Main Street	31	$2,619,830
2021	607431	Westminster	Westminster- Resurfacing & Related Work on Route 140, from Route 2A to Patricia Road	15	$1,500,746
2021	608548	Winchendon	Winchendon- Improvements & Related Work on Central Street (Route 202), from Front Street to Maple Street (0.5 Miles)	29	$4,954,875
2021	608888	Gardner	Gardner- Reclamation and Related Work on Pearson Boulevard	25	$864,519
2022	604499	Leominster	Leominster- Reconstruction/ Rehabilitation on Route 12 (Central Street), Including Rehabilitation of L-08-022	38	$9,537,724
2023	607604	Multiple	Sterling- West Boylston- Improvements on Route 140 at I-190	14	$773,000
2023	608793	Hubbardston	Hubbardston- Highway Reconstruction of Route 68 (Main Street), from 1,000 Ft North of Williamsville Road to Elm Street	25	$4,869,038
2023	608891	Gardner	Gardner- Resurfacing and Rumble Strip Installation on Route 140	12	$1,791,202
2023	608784	Templeton	Templeton- Roundabout Construction at The Intersection of Patriots Road, South Main Street, North Main Street and Gardner Road	22	$2,227,694
2024	608832	Lancaster	Lancaster- Interchange Improvements at Route 2 Exit 34 (Old Union Turnpike)	23	$4,800,000
2024	609244	Ashburnham	Ashburnham- Resurfacing & Related Work on Route 101	25	$5,075,000
Appendix	608424	Templeton	Templeton- Reconstruction of Route 68, from King Phillip Trail (Route 202) North to The Phillipston Town Line (2.65 Miles)	17	$5,134,779
Appendix	607432	Westminster	Westminster - Rehabilitation & Box Widening on Rt 140, from Patricia Rd to the Princeton T.L.	15	$4,200,000
Appendix	608415	Athol	Athol- Intersection Improvements at Route 2A and Brookside Road	30	$1,544,720
Appendix	608723	Athol	Athol- Intersection Improvements at Crescent Street and Chestnut Hill Avenue	30	$4,371,060
Appendix	609213	Harvard	Harvard- Resurfacing and Box Widening on Ayer Road, from Route 2 to the Ayer Town Line	27	$5,520,000
Appendix	609279	Gardner	Gardner- Roundabout Construction at Elm Street, Pearl Street, Central Street and Green Street	25	$3,000,000
Appendix	609227	Ayer	Ayer- Roadway Rehabilitation on Route 2A/111 (Park Street and Main Street)	23	$4,800,000
Appendix	606420	Fitchburg	Fitchburg- Intersection & Signal Improvements @ Rt 2A (Lunenburg St) & John Fitch Highway	28	$1,800,000
Appendix	606640	Ayer	Ayer- Resurfacing & Related Work on Rt 2A (Fitchburg Rd & Park St)	25	$2,400,000
Appendix	608177	Ashby	Ashby - Reconstruction of Route 119 (Townsend Road) from Bernhardt Road to Route 31.	21	$6,727,500
Appendix	608879	Winchendon	Winchendon- Resurfacing & Related Work on Maple Street (Route 202), from Vine Street to Glenallen Street (1.36 Miles)	15	$1,680,444

FFY 2020-2024 Target Eligible Projects Equity Analysis

An analysis of the geographic distribution of the twenty-four projects within the 2020-2024 TIP resulted in an understanding of the percentage of TIP projects and TIP funds allocated within Environmental Justice and Title VI geographic areas. The results of this analysis are as follows:

- Of the 24 projects analyzed based on EJ and Title VI identified populations, a population impacted by the TIP project was calculated. This is listed in row 4 in the table below.
- When compared to the total regional EJ or Title VI population listed in row 2 of the table, the impacted percentage of these EJ and Title VI populations range from 10.24% to 72.88 % (as listed in row 6 of the table).
- The EJ population of Limited English Proficiency (LEP) per Household does not figure into this analysis as only one block group met the EJ criteria of 25% or more there were no projects impacting this block group.

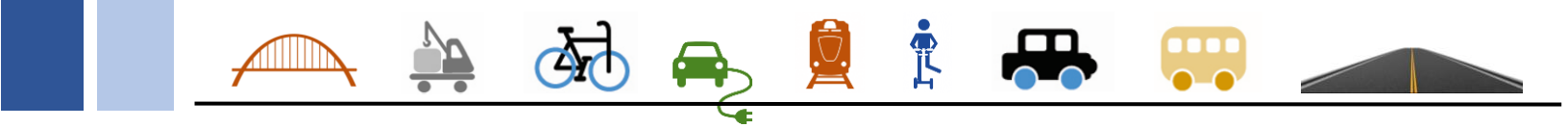


Table 6-5: FFY 2020-2024 TIP Target Eligible Projects Equity Analysis Summary – Populations Impacted

		EJ Block Groups			FTA Title VI Block Groups		FHWA Title VI Block Groups		FHWA Title VI Census Tracts		
		Income	Minority	LEP HH	Minority	Low Income	Elderly	Minority	Disabilities	Foreign Born	Language
1	Total Regional Population	242,671	242,671	91,041 (HH)	242,671	233,995	242,671	242,671	242,671	242,671	242,671
2	Total Regional EJ/Title VI Population	N/A	29,695	2,322 (HH)	29,695	25,377	36,671	29,695	29,194	19,710	34,985
3	Percent of Total Regional EJ/Title VI Population vs. Total Regional Population	N/A	12.24%	2.55%	12.24%	10.85%	15.11%	12.24%	12.03%	8.12%	14.42%
4	Regional EJ/Title VI Population Impacted by TIP Projects	N/A	3,603	0	21,124	18,495	3,755	6,155	3,335	6,212	9,441
5	Percent of Regional EJ/Title VI Population Impacted by TIP Projects vs. Total Regional Population	N/A	1.48%	0.00%	8.70%	7.90%	1.55%	2.54%	1.37%	2.56%	3.89%
6	Percent of Regional EJ/Title VI Population Impacted by TIP Projects vs. Total Regional EJ/Title VI Population	N/A	12.13%	0.00%	71.14%	72.88%	10.24%	20.73%	11.42%	31.52%	26.99%

- An examination of the project costs versus the EJ/Title VI populations impacted, shows that of the approximate $90,024,000 for the 24 identified target projects, anywhere from a low of 25.00% ($22,508,000 to a high of 80.02% ($72,039,000) are expect to be spent impacting, or benefiting, EJ and Title VI populations.
- As with the previous table, no impacted was identified for the EJ LEP Household population due to the limited number of block groups (one) that meet the EJ criteria.

Table 6-6: FFY 2020-2024 TIP Target Eligible Projects Equity Analysis Summary – Project Costs

	EJ Block Groups			FTA Title VI Block Groups		FHWA Title VI Block Groups		FHWA Title VI Census Tracts		
	Income ($ * 1,000)	Minority ($ * 1,000)	LEP HH ($ * 1,000)	Minority ($ * 1,000)	Low Income ($ * 1,000)	Elderly ($ * 1,000)	Minority ($ * 1,000)	Disabilities ($ * 1,000)	Foreign Born ($ * 1,000)	Language ($ * 1,000)
Total Cost of TIP Projects in Region	$90,024	$90,024	$90,024	$90,024	$90,024	$90,024	$90,024	$90,024	$90,024	$90,024
Total Cost of Projects Impacted by EJ/Title VI Populations	$22,508	$24,843	$0	$47,101	$48,498	$72,039	$50,178	$29,874	$39,806	$27,601
Percentage of EJ/Title VI Project Costs vs. Total Regional Project Costs	25.00%	27.60%	0.00%	52.32%	53.87%	80.02%	55.74%	33.18%	44.22%	30.66%

2015-2019 Projects Five Year Lookback

The following table identifies 27 projects for the Montachusett Region implemented in the last five years, i.e. from FFY 2015 to FFY 2019. All projects appeared in a prior TIP and were advertised for construction, initiated construction or completed construction prior to the development of this TIP.

Table 6-7: FFY 2015-2019 TIP Five Year Look Back Projects

TIP Year	MassDOT ID #	Community	Description	Est Cost
2015	604439	Winchendon	Multi-Use Trail Construction (North Central Pathway - Phase V) Includes W-39-023, W-39-024 & W-39-028	$1,987,709
2015	604960	Clinton	Reconstruction & Related Work on Water Street and Bolton Road (1.2 Miles)	$4,433,939
2015	607114	Lancaster	Bridge Replacement, L-02-018, Jackson Road Over Route 2	$5,924,599
2015	607419	Westminster	Deck Replacement, W-28-023, Route 2A/140 Over Route 2	$2,672,775
2015	607909	Sterling	Bridge Joints Repairs and Beam-End Repairs At 5 Bridges On I-190	$10,021,616
2016	604515	Royalston	Bridge Replacement, R-12-006, North Fitzwilliam Road Over Lawrence Brook	$1,313,437
2016	604838	Winchendon	Bridge Replacement, W-39-001, Harris Road Over Tarbell Brook	$2,129,943
2016	604928	Leominster	Reconstruction of Mechanic Street, From Laurel Street to The Leominster Connector	$2,929,315
2016	604699	Sterling	Intersection Improvements at Rt 12 And Chocksett Rd	$4,700,000
2017	607529	Winchendon	Bridge Replacement, W-39-015, North Royalston Rd Over Tarbell Brook	$2,243,868
2017	608250	Royalston	Bridge Replacement, R-12-001 (B35), Stockwell Road Over Lawrence Brook	$857,005
2017	607475	Winchendon	Resurfacing & Related Work on Route 12, From Mill Street/Beginning of State Highway to New Hampshire State Line	$1,571,623
2018	608188	Gardner/ Leominster/ Sterling	Intersection Improvements at 3 Locations	$2,622,497
2018	606124	Fitchburg/ Lunenburg/ Leominster	Reconstruction of Summer Street and North Street	$9,939,131
2018	608179	Royalston	Bridge Replacement, R-12-009, North Fitzwilliam Road Over Lawrence Brook	$1,721,880
2018	605094	Fitchburg	Bridge Replacement, F-04-003, State Route 31 over Lawrence Brook	$3,120,258
2018	608864	Gardner	Bridge Replacement, G-01-008, Pleasant Street over the B&M Railroad	$4,404,240
2019	608728	Winchendon	Resurfacing & Related Work on Route 202, From the Templeton Town Line to Main Street (3.1 Miles)	$1,795,875
2019	604961	Clinton	Resurfacing & Related Work on Route 110 (High Street)	$3,153,674
2019	607848	Hubbardston	Resurfacing & Related Work on Route 68, From Williamsville Road to the Gardner C.L.	$4,190,296
2019	607446	Westminster	Intersection Improvements, Route 2A at Route 140	$2,139,574
2019	608260	Athol	Bridge Replacement, A-15-005, Washington Ave Over Athol Pond Outlet & A-15-004 Morgan Ave Over Athol Pond Outlet	$2,160,029
2019	608259	Townsend	Bridge Replacement, T-07-013, West Meadow Road Over Locke Brook	$3,163,200
2019	607127	Hubbardston	Bridge Replacement, H-24-009, Evergreen Road Over Mason Brook	$3,361,720
2019	608612	Athol	Bridge Replacement, A-15-008, Crescent Street Over Millers River	$5,112,455
2019	608475	Lancaster/ Harvard	Resurfacing & Related Work on Route 2	$18,558,222
2019	608193	Fitchburg/ Leominster	Rail Trail Construction (Twin Cities Rail Trail)	$13,000,250
				$119,229,130

2015-2019 Projects Five Year Lookback Equity Analysis

An examination of projects funded over the last five TIPs, identified 27 individual projects with an estimated total cost of $119,229,130. A geographic distribution of these 27 projects against those areas categorized as Environmental Justice (EJ) or Title VI areas resulted in the following:

- Of the 27 projects analyzed based on EJ and Title VI identified populations, a population impacted by the TIP project was calculated. This is listed in row 4 in the table below.
- When compared to the total regional EJ or Title VI population listed in row 2 of the table, the impacted percentage of these EJ and Title VI populations range from a low of 4.82% (or 112 LEP Households) to a high of 73.86% for Low Income individuals defined by FTA Title VI guidelines. See row 6 of the following table.
- The EJ population of Limited English Proficiency (LEP) per Household has the lowest percent impact again due to the criteria developed for this population.

Table 6-8: FFY 2015-2019 TIP Five Year Look Back Projects Equity Analysis Summary – Populations Impacted

		EJ Block Groups			FTA Title VI Block Groups		FHWA Title VI Block Groups		FHWA Title VI Census Tracts		
		Income	Minority	LEP HH	Minority	Low Income	Elderly	Minority	Disabilities	Foreign Born	Language
1	Total Regional Population	242,671	242,671	91,041 (HH)	242,671	233,995	242,671	242,671	242,671	242,671	242,671
2	Total Regional EJ/Title VI Population	N/A	29,695	2,322 (HH)	29,695	25,377	36,671	29,695	29,194	19,710	34,985
3	Percent of Total Regional EJ/Title VI Population vs. Total Regional Population	N/A	12.24%	2.55%	12.24%	10.85%	15.11%	12.24%	12.03%	8.12%	14.42%
4	Regional EJ/Title VI Population Impacted by TIP Projects	N/A	12,133	112	20,519	18,744	10,463	18,600	16,691	12,890	24,983
5	Percent of Regional EJ/Title VI Population Impacted by TIP Projects vs. Total Regional Population	N/A	5.00%	0.12%	8.46%	8.01%	4.31%	7.66%	6.88%	5.31%	10.30%
6	Percent of Regional EJ/Title VI Population Impacted by TIP Projects vs. Total Regional EJ/Title VI Population	N/A	40.86%	4.82%	69.10%	73.86%	28.53%	62.64%	57.17%	65.40%	71.41%

- An examination of the project costs versus the EJ/Title VI populations impacted, shows that of the approximate $119,229,000 spent on the 27 look back projects, anywhere from 28.73% ($34,253,000) to 81.29% ($96,922,000) was spent that had an impact or benefit on EJ and Title VI populations.
- As with the previous table, no impacted was identified for the EJ LEP Household population due to the limited number of block groups (one) that meet the EJ criteria.

Table 6-9: FFY 2015-2019 TIP Five Year Look Back Projects Equity Analysis Summary – Project Costs

	EJ Block Groups			FTA Title VI Block Groups		FHWA Title VI Block Groups		FHWA Title VI Census Tracts		
	Income ($ * 1,000)	Minority ($ * 1,000)	LEP HH ($ * 1,000)	Minority ($ * 1,000)	Low Income ($ * 1,000)	Elderly ($ * 1,000)	Minority ($ * 1,000)	Disabilities ($ * 1,000)	Foreign Born ($ * 1,000)	Language ($ * 1,000)
Total Cost of TIP Projects in Region	$119,229	$119,229	$119,229	$119,229	$119,229	$119,229	$119,229	$119,229	$119,229	$119,229
Total Cost of Projects Impacted by EJ/Title VI Populations	$34,253	$49,085	$0	$96,922	$92,828	$78,188	$60,561	$55,272	$59,749	$36,078
Percentage of EJ/Title VI Project Costs vs. Total Regional Project Costs	28.73%	41.17%	0.00%	81.29%	77.86%	65.58%	50.79%	46.36%	50.11%	30.26%

Summary of Equity Analysis for Highway Projects

The percentage of TIP funds that have been allocated in Environmental Justice and FHWA or FTA areas is greater than the percentage of the region's population that reside in those areas. Overall, it can be determined that the projects implemented through the TIP process in the past five years have benefitted the Environmental Justice and Title VI populations in an equitable manner. Such analysis will be conducted on a yearly basis to ensure that the Environmental Justice and Title VI populations continue to benefit from the transportation planning process in the Montachusett Region.

Public Right of Way – ADA Transition Plans

As part of the Montachusett Unified Planning Work Program (UPWP), MRPC staff coordinated with the MassDOT effort, and other MRPC staff efforts, to bring about municipal Americans with

Disabilities Act (ADA) Transition Plan compliance in the MRPC region. The ADA Act provides standards that secure accessibility of public services and facilities for people with disabilities.

What is a Plan?

- A Plan details how accessibility issues or deficiencies within the PROW will be corrected, scheduled, budgeted for, and monitored for progress and compliance
- A Plan is a living document that must be updated regularly as projects are completed or changes occur within the PROW to reflect real world conditions and monitor any noncompliance areas within the public right of way

What led to Plans being required?

- The Americans with Disabilities Act - 1990, ADA, is a civil rights law that protects individuals with disabilities from discrimination on the basis of disability
- Title II of the ADA prohibits discrimination in all services, programs and activities provided to persons with disabilities by State and Local governments, including the pedestrian facilities in the PROW
- The ADA applies to all facilities built both before and after 1990

MRPC Member Municipalities ADA Plan Compliance

To accomplish this task for Member Municipalities, the MRPC first sought to learn the full ADA Transition Plan (ADA Plan - is for all services, programs and activities, not only PROW) compliance status for each Member Municipality. Staff sought to assess the ADA Plan compliance status of each Member Municipality as follows:

- Sought MassDOT input from their ongoing public engagement process for the purpose of possibly obtaining the ADA Plan compliance status of each Member Municipality
- Sought input from the Massachusetts Office on Disability (MOD) concerning the ADA Plan compliance status of each Member Municipality
- Communicated this effort to the Member Municipalities at meetings and other venues
- Developed an online ADA Plan Status Survey (Survey) for Member Municipalities to complete

- Member Municipalities were notified that the Survey was available for their completion on Monday May 7th, 2018. The Survey was closed on Friday June 1st, 2018

Municipal ADA Plan Status Survey Key Findings

17 of 22 (77%) of the MRPC Member Municipalities completed the Survey

Key Survey Findings:

Key Question: Does your Municipality have an ADA Plan in place?

- Seven (41%) Municipalities **DO NOT HAVE** an ADA Plan in place

  All seven are interested in:

  - Developing an ADA Plan
  - Receiving assistance to develop an ADA Plan
  - Receiving training to develop an ADA Plan

  Six of the seven:

  - Agreed to be contacted at a later date with additional follow up info pertaining to developing an ADA Plan

- Seven (41%) Municipalities **HAVE** an ADA Plan in place

  Of the seven Municipalities that HAVE an ADA Plan in place, six Municipalities

  - Need to update their ADA Plan
  - Are interested in updating their ADA Plan and may be interested in receiving assistance to update the ADA Plan

  Of the seven Municipalities, five agreed to be contacted at a later date with additional follow up info pertaining to developing an ADA Plan

- Two Municipal Officials completed the Survey for each of the three remaining Municipalities that completed the Survey

  Of those Municipalities:

  - One Municipality has an ADA Plan in place and does not need to be updated
  - One Municipality has an ADA Plan in place that needs to be updated, is interested receiving assistance to update the ADA Plan and agreed to be

contacted at a later date with additional follow up info pertaining to updating the ADA Plan

- One Municipality is interested in developing an ADA Plan, is interested receiving assistance to develop an ADA Plan and agreed to be contacted at a later date with additional follow up info pertaining to developing an ADA Plan

Survey Summary

Of the 17 Member Municipalities that completed the Survey:

- Eight (47%) Municipalities need ADA Plan development
- Seven (41%) Municipalities need an updated ADA Plan
- Two (12%) Municipalities do not need an ADA Plan or an ADA Plan Update

Lancaster Pilot Plan

Since the completion of the Survey, Staff began the development of a Pilot Plan with the Town of Lancaster (Town). Staff began with the Self-evaluation phase of the Plan which, in cooperation with Town officials, created a municipal ADA Advisory Team that includes:

- Local ADA Officials
- Disabled community members
- Public works
- Disabled advocates
- Other interested parties and Staff

The ADA Advisory Team met to discuss the expectations, need, importance and purpose of the Plan. Staff then conducted a technical survey with a local volunteer of a prioritized list of the existing PROW pedestrian facilities within Town jurisdiction. However, pedestrian facility elements such as curb ramp width, ramp running slope, ramp cross slope and gutter flow line slope were not measured for compliance. The Pilot Plan was put on hold as the MRPC decided to take this task in a new direction by procuring a consultant to undertake this task.

Procuring a Consultant

After going through an extensive procurement process, the MRPC procured Stantec as a consultant to assist Staff in completing Plans for three Member Municipalities. Stantec has the

traffic engineering experience that is needed to assist Staff in completing the Plans and is well informed of the current Federal and Massachusetts guidelines and design standards for evaluating the compliance of PROW pedestrian facilities. Stantec has completed Plans for Somerville, MA and other municipalities in Massachusetts. The three Member Municipalities that Plans will be completed for include Lancaster, Lunenburg and Winchendon.

Transit Equity

The Montachusett Regional Transit Authority (MART) operates the fixed route transit system in the region. Fixed route service is concentrated within the urban cities of Fitchburg, Leominster and Gardner. Over the years, service has expanded slowly into neighboring communities based upon need, local requests and area attractions. MART has been striving to accomplish many of the goals that were set established in the 2015 RTP. Below are some bullets points on the many changes and growth experienced – or perhaps not experienced over the last four years.

1. MART, as a result of the Comprehensive Service Analysis, revised its bus schedules for all local routes in Fitchburg/Leominster and Gardner effective in September 2015.
2. Route 11 was re-routed to the new Great Wolf Lodge resort in Fitchburg to accommodate the workforce of that business.
3. Brokerage services continue to increase in volume every year. Services have grown from $105 million in 2014 to $160 million in 2018.
4. MART added three new fixed route shuttles since the last RTP:
    a. Wachusett Shuttle run between Gardner and Wachusett Station began on 9/30/2016 to coincide with the opening of Wachusett Station.
    b. On April 24, 2017 MART began a pilot project to provide service between Fitchburg/ Leominster, Shirley, Ayer and the Devens Enterprise Zone. The service was designed by a public-private collaborative between MART, the Devens Enterprise Commission, Mass Development, and private companies.

c. On June 4, 2018 MART began a "last mile" commuter rail shuttle service. This shuttle travels between the MBTA Littleton Commuter Rail Station and run along Route 110 in Littleton and Westford out to the Westford Technology Park.

Additionally, on a regular basis, the MRPC conducts Transit Development Plan (TDP) for the fixed route communities that involve a review of demographics, attractions and local public outreach to identify issues and needs for the system. From these studies, adjustments are made to better serve the population.

In September 2018, the Montachusett MPO endorsed a "Coordinated Public Transit–Human Services Transportation Plan (CPT-HST)" Update that documents the region's unmet human-service transportation needs of individuals with disabilities, low-income individuals (or persons below the poverty level) and the elderly. The target populations for the CPT-HST align with the Title VI and EJ target populations.

The CPT-HST Plan was developed as a tool to help local transportation providers and communities improve transportation services, increase efficiency of service delivery, and expand outreach to meet growing needs. It also seeks to provide a framework to guide the investment of existing transportation resources and the acquisition of future funds. A series of priorities and recommendations are included in the CPT-HST Update to address transit equity issues and are incorporated in this RTP within the Transit chapter.

Trends

After analyzing the types of projects being implemented, it seems that the majority of highway projects continue to consist of improvements to already existing infrastructure (ex. roadway resurfacing and rehabilitation, and bridge repair) as opposed to building new facilities and therefor do not bear an undue burden or benefit as compared to the rest of the region. These types of projects allow for smoother navigation through these areas (by personal vehicle, bicycling, walking or public transit) and provide improved access for commuting.

The region continues to make strong connections with Title VI and EJ populations through email communication and meeting attendance. This pattern continues to increase yet the return on participation has yet to catch up. It is the hope that participation will show signs of increasing as the connections continue to grow.

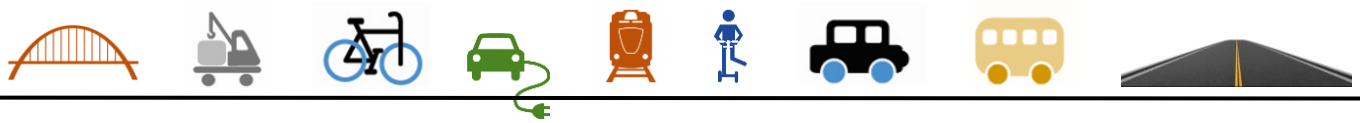
Recommendations

The MRPC continues to strive to solicit meaningful participation with Title VI and EJ populations through their Public Participation Plan, Limited English Proficiency Plan, and its submittals to MassDOT and the Federal transportation agencies through the Title VI. For this planning document there was extensive outreach to the EJ and Title VI populations by both daytime and evening meetings with locations along the public transportation routes, contacted public service agencies, online surveys in English and Spanish, and were included as meeting topics during other agency meetings. With that being said, there is always room for improvement. These improvements may include the following:

- Advance the outreach process by making stronger connections with Title VI and Environmental Justice type organizations and individuals.
- Continue to coordinate with local communities/organizations/advocates to monitor and address issues as they relate to identified target populations.
- Expand our mailing list to include other Title VI and EJ populations and organizations.
- Continue to monitor and advocate for TIP projects that show a benefit to Title VI and EJ areas.

Equity in the Development of Recommendations

A majority of the recommendations developed were not targeted towards a specific EJ/Title VI population but rather were based upon comments received and the trends and deficiencies identified throughout the RTP development process. The needs of the equity populations do however play a role in the recommendation development process, i.e. the specific needs of these individuals have benefits beyond their particular populations. Improvements such as expanded



transit options, improved road, bicycle and pedestrian networks, medical, commercial and employment access and safety improvements, affect the efficiency, reliability and accessibility of the various transportation networks in the Montachusett region and subsequently benefit all populations. This same approach was utilized in the development of the planning scenarios discussed later in this RTP.

7 Regional Trends & Recommendations

REGIONAL TRENDS & RECOMMENDATIONS

The following is a summary of all regional trends identified within this plan. Determining and monitoring these trends is an important factor in making informed decisions in the region. These trends, along with accompanying recommendations will serve as a checkup of the regional transportation network and remedies to help guide it into the future.

Demographics Trends

Through the development and analysis of the demographics and projections for the Montachusett region, the following trends were identified and noted. Following these trends, a series of recommendations are presented for the region.

- Current growth expected to continue but future projections anticipate a slowdown and gradual decline.
- The population in the region is aging faster than in the state or nation. This trend is also reflected in the 2020, 2030 and 2040 projections where the overall growth in the population of the region is expected to slow and decline. This aging of a large proportion of the population poses a number of planning challenges for the Region, including accessibility to health care and elderly services, public transportation, senior housing. In addition, there will be generational shifts in employment sectors and the workforce.
- Educational attainment rates are increasing in the regions male and female populations. However, they still remain lower than state averages. Efforts are needed in the Region to retain this increasing educated population and subsequently help to address shifts in the employment sectors.
- Ten Montachusett communities have a higher proportion of residents with a disability than the state as a whole. Athol, Phillipston, and Fitchburg top the list. Among other planning considerations, the high percentages of residents with disabilities, coupled with

a steadily aging population, only help to emphasize the importance of multimodal and functional transportation network.

- Fifteen (15) of the region's 22 communities have a lower per capita income than the state ($39,913), while nine rank below the state when examining median household income.
- An estimated 11% of individuals are living in poverty within the Commonwealth of Massachusetts. Six Montachusett communities have a higher concentration of poverty than the state as a whole, with Fitchburg (17.9%), Gardner (16.7%), and Athol (14.7%) also exceeding the national poverty rate of 14.6%. Between 2016 and 2017, poverty rates declined in the region at a quicker pace than both the state and nation. In order to reverse these trends, additional opportunities to create a more diverse employment sector is needed. Along with this, is the need for improved access to these jobs at a reasonable cost for those in the lower income strata.
- Based on an analysis of current and past transportation and highway projects versus identified Environmental Justice and Title VI populations, there does not appear to be an undo benefit or burden on these populations.
- Housing in the region trends toward single family homes. This along with a rising median home values can affectively price individuals out of the Montachusett Region. This can be especially harmful to younger, more highly educated individuals, which in turn can exasperate the aging population situation. In order to serve the regions changing population characteristics, i.e. aging, diversified, and low income, affordable housing units (either as single or multiple units) need to be an emphasis for the region's officials. Additionally, where appropriate direct tie ins to available transportation options should be a major factor for local officials in this area.
- Manufacturing continues to remain the largest employment sector in the region (17% of total employees) and integral to the economic health of many communities. The level of manufacturing-based employment, despite the decline in recent decades, continues to out strip that of both the state and country. While efforts continue toward diversifying the regional economy into other growing sectors, including the service sectors, the

region's comparative advantage of an experienced manufacturing workforce and industrial space will help keep manufacturing as a cornerstone in the region's economy.

- Montachusett Region commuters are more auto-reliant than in the state or the nation. Ninety percent (90%) of workers either drive alone or carpool to work as compared to 78% of workers in Massachusetts, and 85% of workers in the country. Montachusett residents are also significantly less reliant upon public transit. The longer commute times and distances of Montachusett individuals tend to put more emphasis on the traditional commuter roads in the region, i.e. Route 2, I-190, Route 117, Route 119, Route 140, Route 12, etc. The potential for increased public transit usage exists if expansion and costs can be implemented in a reasonable fashion. In addition, these segments of commuters are also likely to be impacted by technological changes in travel modes, i.e. autonomous vehicles, rideshare options and alternative energy vehicles. With a greater demand or usage of these technologies, critical support infrastructure is needed from long term parking areas for autonomous vehicles, to charging stations, to incentive programs.

Demographic Recommendations

The following is a series of recommendations based upon the identified trends related to the demographic profile of the Montachusett Region. It should not be viewed as a complete and finite list but rather a starting point for the continued review of the needs of the region.

1. The aging of the region's population requires that several issues be addressed:
    a. Expanded transit options to vital services for elderly. Expansion to needed services such as medical and shopping should remain a priority. Additionally, connections between communities should be examined and implemented where feasible.
    b. Upgrades, expansion and improvements to the pedestrian network in the core centers of communities and in and around identified service areas, i.e. medical facilities, shopping centers, etc. Safer sidewalks and pedestrian corridors will also serve other segments of the population beyond the elderly.

c. Safety improvements along the road and pedestrian/bicycle networks need to be expanded and prioritized to help deal with the aging population as well as assisting with other segments with their activities.

2. Identification and prioritization are needed for projects that assist the disabled community throughout the region. This would include better sidewalks, improved access to transit options, and eliminating gaps in the network that prevent or discourage usage (ex. incomplete or non-existing sidewalks on fixed route transit lines).
3. Expansion of employment opportunities are needed in order to retain and expand the regional workforce. As the educational level continues to rise in the region, without adequate employment options, the population will continue to age as younger individuals seek better paying jobs outside of the region. Network improvements are needed to assist and encourage employers to remain in the region. This would involve infrastructure improvements to support industries, multiple travel options to bring employees to and from work, and expansion of outreach efforts to all segments of the population. Continued emphasis on maintaining pavement conditions and reducing bridge deficiencies will allow for greater marketing by municipalities of available industrial and commercial areas.
4. Expansion of mode options for commuters needs to also be a priority for the region. This would also involve the region's trail/pedestrian/bicycle networks. These systems can be improved and expanded in order to provide additional walking and biking mode options.
5. Additional planning is needed to address future technological advances in transportation as they occur and become more and more feasible. This would include issues such as:
    a. Autonomous vehicles. Where will they "park" when riders have reached their destinations? Is there a need for special lots or facilities? Are there potential congestion issues at the start and end of work shifts? Will "peak hours" increase because the autonomous vehicle may be making additional trips to desired locations (i.e. one trip in and one trip out in both the AM and PM (4 trips) as opposed to a driver that has one trip in and one trip out in the AM and PM (2 trips))?

b. Alternative energy vehicles. Where should charging stations be located? How many facilities exist and do they adequately serve the population now? Environmentally, are there any drawbacks associated with batteries, etc., that need to be addressed?

c. Ride share options. Can these systems be expanded to address the needs of the elderly, low income and disabled populations? Can the systems expand to the more rural communities to serve these areas without viable transit options?

6. The population is getting more and more diverse in terms of minority populations and language. Additional efforts are needed to draw these individuals into the transportation planning process to ensure adequate representation and service.

Infrastructure Trends

Analysis of roads and bridges in the Montachusett region demonstrate a network that is relatively stable, however, in danger of deterioration if proper investments are not maintained. It is important to prioritize maintenance and repair of these existing infrastructures to be able to maximize public funds and allow additional investments for improvements and expansion.

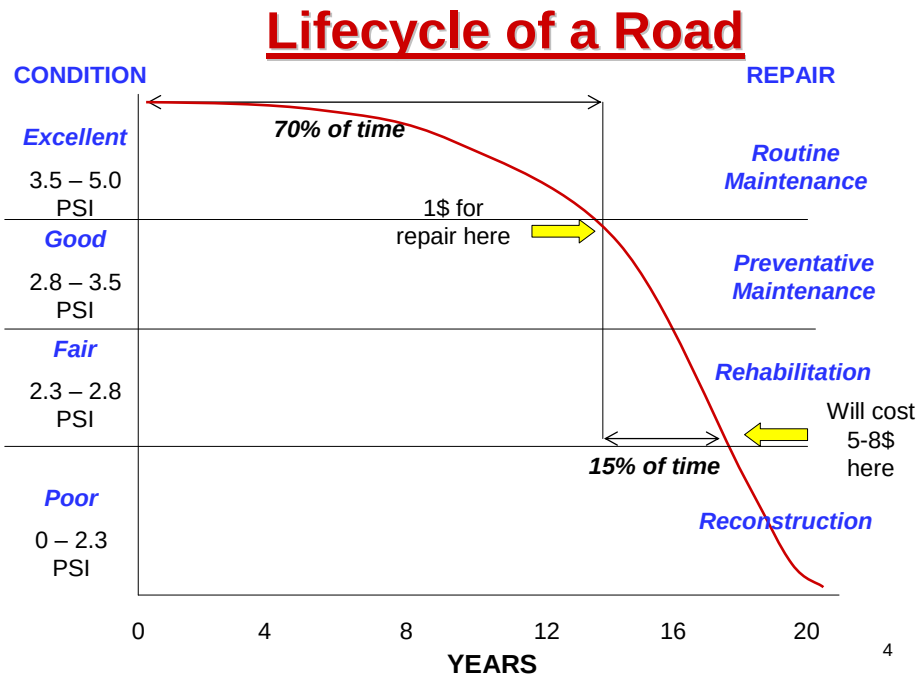
Infrastructure Recommendations

The transportation system in the Montachusett region largely consists of roads and bridges. Maintaining these assets are a challenge, however, we must understand the importance of a properly functioning and safe system. Maintaining a state of good repair should be a main priority and in our best interest in order to stretch our investments to the greatest benefits. Ultimately, it is recommended that investments are guided by proven asset management practices and the proper amount of investment is made to assure these assets do not deteriorate.

The figure below displays the concept of pavement lifecycle cost. A pavements lifecycle is the time between reconstruction periods. Lifecycle cost is the total cost spent on maintenance and repairs for a particular pavement section during its lifecycle. One of the main focuses of

pavement management is to keep lifecycle cost low to stretch the dollar in what is commonly an ever-decreasing maintenance budget.

Figure 7-1: Lifecycle of a Road



Due to the rising cost of improvements and the declining funds for preserving existing infrastructure it is challenging to make improvements to the pavement network. Building a historical and measurable database of conditions in the Montachusett region allows for a snapshot of overall conditions which will allow us to determine how the network changes over time. Maintaining historical databases of bridge and pavement data paired with applying proven methods of asset management is recommended.

Infrastructure Action Items

1. Continue to monitor network conditions to determine trends.
2. Encourage use of pavement management principals among communities in region and in decision making.

Safety Trends

Even as the regional population and number of vehicles on the roadways continues to increase, total fatality crashes have not increased. Incapacitating injury crashes decreased significantly but non-motorized crashes increased slightly and total overall crashes continue to rise. It has been proven that the safety projects have resulted in a reduction of crashes and the projects mentioned above are now no longer listed on the high crash listing. It is because of this that serious crash locations will continue to be a focus of the safety planning efforts for the MRPC.

Safety Recommendations

Future Safety Improvement Projects at Fatality Locations

- **Table 7-2** below shows five Fatal Crash Corridors (FCCs) where two or more Fatalities occurred in Member Communities from 2012 – 2014
- The MRPC maintains an FCC Table that currently contains 42 FCCs
- Member Communities may choose to contact the MRPC for the FCCs within their community
- MRPC staff will contact Member Communities concerning the FCCs for further study and potential project development

Table 7-2: Fatal Crash Corridors with Two or More Fatalities

COMMUNITIES	FATAL CRASH CORRIDORS	Fatal	Injury	PDO	Total Corridor Crashes
Ayer	Route 2A & Washington Street	2	18	57	*77*
Fitchburg	Route 2A/31, Westminster St	3	20	70	*93*
Fitchburg & Ashby	Route 31, Fitchburg/Ashby	3	19	92	*114*
Lunenburg & Leominster	Route 13, Electric Ave / Main Street	2	35	121	*158*
Westminster	Route 2A, State Road West	2	4	6	*12*
	TOTAL CRASHES				*454*
	Total Crashes by Severity	*12*	*96*	*346*	
	Percentage of Total Crashes by Severity	*2.6%*	*21.1%*	*76.2%*	

Future Safety Improvement Projects at High Crash Locations (HCLs):

- **Table 7-3** below is a list of the top 18 HCLs in Member Communities.
- **Table 7-4** below includes 12 HCLs (of the remaining 87 HCLs) that coincided with all remaining Bike HCLs or Ped HCLs in Member Communities.
- The MRPC maintains an HCL Table that currently contains 105 HCLs.
- To continue to improve safety at HCLs, safety improvement projects need to be considered for development based on the strategies and actions found in the SHSP applicable Emphasis Areas.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact the MRPC for the HCLs within their community.
- MRPC staff will contact Member Communities concerning the HCLs for further study and potential project development.

See the **Financial Analysis** chapter for the estimated cost of the projects listed in the FCC Table and the HCC Table.

Table 7-3: Top 17 HCLs in MMPO Member Communities

COMMUTITIES	LOCATION NAME	2014 TABLE	BIKE HCL 2015	PED HCL 2015	Top 200 2015	Top 200 2016*
FITCHBURG	WATER STREET (SR12 NB) at WANOOSNOC ROAD	•			•	•
	BOULDER DRIVE at MAIN STREET (SR2A EB)	•		•		•
	SOUTH STREET at WANOOSNOC ROAD	•			•	
	WHALON STREET at PIERCE AVENUE	•			•	
	WATER STREET (SR12 NB) at BIRCH STREET	•				
	FRANKLIN ROAD at OAK HILL ROAD					•
GARDNER	PEARSON BOULEVARD at UNION SQUARE	•			•	
	TIMPANY BOULEVARD (SR68 NB)	•				
HARVARD	AYER ROAD (SR110 EB) at CONCORD TURNPIKE (SR2	•				
LANCASTER	ROUTE 2 (SR2 EB) at JACKSON ROAD	•				
LEOMINSTER	ROUTE 2 (SR2 EB) at RAMP-RT 12 NB TO RT 2 WB	•				
	NORTH MAIN STREET (SR12 NB)	•			•	
	MAIN STREET (SR13 NB) at NASHUA STREET	•	•		•	
	NORTH MAIN STREET (SR12 NB) at HAMILTON STREET	•				•
	ROUTE 2 (SR2 EB) at MEAD STREET	•				
	ROUTE 2 (SR2 EB) at MERRIAM AVENUE	•				
SHIRLEY	TOWNSEND ROAD at GROTON ROAD (SR225 EB)	•				

*Top 200 statewide (MassDOT). MassDOT changed the HCL methodology for 2016

Table 7-4: HCLs with Coinciding Bike and/or Ped HCL in 2015

COMMUNITIES	LOCATION NAME	2014 TABLE	BIKE HCL	PED HCL 2015
ATHOL	MAIN STREET (SR2A EB) at EXCHANGE STREET*	•	•	•
FITCHBURG	MAIN STREET (SR2A EB)	•		•
	MAIN STREET at MILL STREET	•		•
	MAIN STREET at WATER STREET	•		•
	MAIN STREET at CUSHING STREET	•		•
GARDNER	MAIN STREET (SR68 NB) at WILLOW STREET	•		•
	MAIN STREET (SR68 NB) at TIMPANY BOULEVARD (SR68 SB)	•		•
	TIMPANY BOULEVARD (SR68 SB)	•		•
LEOMINSTER	WEST STREET at PARK STREET	•		•
	MAIN STREET (SR12 NB) at MONUMENT SQUARE (SR12 NB)	•		•
	MAIN STREET (SR13 NB) at PROSPECT STREET	•	•	
	MAIN STREET (SR13 NB) at RIVER STREET	•	•	
	MECHANIC STREET at WATER STREET	•		•

*not an HCL in 2015

Safety Action Items

1. Complete planned safety improvements projects
2. Place a focus on improving safety on Fatal Crash Corridors
3. Place a focus on improving safety at Incapacitating Injury Locations
4. Continue improving safety at High Crash Locations
5. Continue identifying safety problem locations for implementing future safety improvement projects
6. Conduct RSAs and develop future UPWP tasks
7. Continue liaison with MassDOT Safety program and MRPC member communities to implement items 1 - 6

Bike & Pedestrian Trends

The desire for more multi modal transportation options within the Montachusett Region has increase significantly over the past few years. More people are seeing the value in having these types of transportation options and are also advocating for the development of new, safer, bicycle and pedestrian facilities throughout the region. Programs such as Complete Streets and Safe Routes to School are gaining support from our communities -

- Complete Streets – 17 out of 22 communities have approved policies, and 8 have received funding for multi modal projects
- Safe Routes to School – 16 out of 22 communities are partners with the program

The State is also contributing financially to trail projects through the MassTrails Grant program. This program provides grants to support recreational trail and shared use pathway projects across the Commonwealth. These grants are reviewed and recommended by the Massachusetts Recreational Trails Advisory Board and the Commonwealth's Inter-Agency Trails Team. There are two funding sources for the grant –

1. Recreational Trails Program (RTP) – these grants are federally funded through the Federal Highway Administration (FHWA), administered at the State level, and provide funding for the development and maintenance of recreational trail projects, both motorized and non-motorized.
2. Commonwealth Trails Grants – "These grants are supported by the State's annual Capital Investment Plan (CIP) and aim to help communities design, create and maintain off-road shared-use pathway connections between where Massachusetts residents live, learn, work, shop and recreate, especially by building out the longer distance regional networks of multi-use pathways across the state and filling in critical gaps in existing networks, or overcoming current barriers to connectivity." (www.mass.gov/guides/masstrails-grants)

Another notable funding source is the Congestion Mitigation and Air Quality Improvement Program (CMAQ) which provides federal funding for states to support projects and programs intended to improve air quality and reduce traffic congestion. Example projects include – traffic flow improvements, public transit services and facilities, bicycle and pedestrian facilities and programs, rideshare activities, etc. The Twin Cities Rail Trail project that is currently scheduled in the FY 2020 & FY 2021 Transportation Improvement Plan was funded through this funding source.

Bike & Pedestrian Recommendations

As these multi modal trail and bikeway projects continue to be studies and developed, funding is always a major component. Increasing the existing funding programs and available dollar amounts are always critical to further these regionally significant projects. Additionally, continuing the study and planning of trail related developments in order to identify priority trails and trail connections are also key for alternate modes of transportation.

Bike & Pedestrian Action Items

1. Encourage and support all communities to participate in the Complete Streets & Safe Routes to School programs.
2. Encourage communities to apply for MassTrails & CMAQ funding for their trail projects.
3. Continue to study priority trails and trail connections.
4. Continue to support the development of trail projects throughout the Montachusett Region.

Economic Vitality Trends

The Economic Vitality section reveals two existing issues that are facilitating an increasing trend in hindering economic vitality growth in the Montachusett Region:

- Aging railroad bridges, most of which were constructed approximately 100 years ago, are narrow and many have bridge height restrictions. Also, the bridge alignment geometry of many railroad bridges is not aligned with the geometry of the intersecting road creating dangerous S- shaped horizontal curves with poor sight distance
- Many Route 2 interchanges, including their ramps, do not have the capacity to meet traffic volume demand. One new interchange is being proposed

The MRPC recognizes that the transportation network plays an important role in the economic growth of the Region. Many sectors of the economy depend heavily on safe and efficient movement of goods and services by truck.

Economic Vitality Recommendations

- Improve freight truck access on the four Critical Urban Freight Corridors CUFCs and three Critical Rural Freight Corridors
- Improve external and internal freight truck access for the 10 Opportunity Zones
- Improve congested roads and bottleneck locations
- Improve safety on fatal crash corridors and at high crash locations
- Improve external and internal access to the regional recreational destinations
- MRPC will continue conducting freight corridor analyses

Economic Vitality Action Items

1. Encourage the improvement of freight truck access on all CUFCs and CRFCs
2. Encourage the improvement of external and internal freight truck access to Opportunity Zones
3. Continue to seek the improvement of congested roads and bottleneck locations
4. Continue to seek the improvement of safety at all unsafe locations
5. Continue to seek the improvement of external and internal access to the regional recreational destinations
6. MRPC will continue conducting freight corridor analyses

Congestion Trends

Counts throughout the region show a period of increased traffic. Along with increased traffic comes heavier and more frequent periods of congestion. Many of the highlighted areas in this section have shown congestion for many years, especially during rush hour. Trends indicate that these areas, along with others, will continue to face problems with congestion as they currently exist.

Congestion Recommendations

It is important to prepare for increased traffic and congestion throughout the region. Investments must be well thought out and balanced with other needs such as investments in maintenance and expansion. The following action items are made to help prevent the spread of congestion in the region.

Congestion Action Items

1. Continue to monitor trends throughout the region.
2. Continue to monitor emerging technologies such as autonomous vehicles and ride hailing services and the impact made on congestion throughout the region.
3. Continue to profile areas of heavy congestion and make recommendations for improvements.
4. Work with MART and the MBTA to increase ridership in modes other than automobiles.

Transit Trends

Analysis of ridership on all MART services indicates a decrease in ridership, which is being experienced all over the country. Filling service gaps, meeting service needs, and increasing accessibility to residents continues to be a priority for MART. MART has been making improvements to its facilities to increase energy efficiency, and continued improvements to its parking facilities at commuter rail stations will benefit commuter ridership and the residents of the Montachusett region.

Transit Recommendations

In order to provide increased mobility for Montachusett area residents that do not own automobiles or that choose to be less dependent on a personal vehicle, MART will need to continue to refine and implement public transit programs designed to increase ridership. It will be necessary to examine the routes and schedules to determine the most efficient and effective service. MART is open to expanding services wherever possible to fill service gaps, meet unmet

regional needs and increase accessibility to health facilities and social services. Where is becomes apparent that certain services are needed, for example evening transportation to local colleges (Mount Wachusett Community College, Fitchburg State University, etc.), MART should continue to work with those institutions to examine requests, organizational involvement and ways to help defray the cost of the additional services. Continued participation of local industries, businesses, major shopping centers and schools in developing appropriate schedules, routes and promotional programs is an important part of this ongoing planning and implementation of services.

Special service provided to the elderly and the disabled will need to be monitored to insure continuation of appropriate levels of service in light of MART's complementary ADA plan. Continue brokerage programs with the Department of Public Health, Department of Developmental Services, MassHealth, Department of Mental Health, MRC, and MCB.

In addition to increased and improved routing and scheduling, it will be necessary for MART to maintain and improve the operating condition of its vehicle fleet. The present vehicle fleet is constantly being replaced with new lift equipped ADA compliant equipment. The Montachusett TIP process should continue to be utilized to upgrade and replace buses and vans for the MART fleet, as well as continue to upgrade maintenance facilities.

Most of the above actions are designed to improve efficiency and lower overall demand on the highway system at a relatively low cost. In summary, there are several key and identifiable avenues by which the MART system can be both properly maintained and improved.

Transit Action Items

1. Continue monitoring of routes and schedules so that any beneficial changes can be identified and implemented;
2. Alternative sources of funding for continued transit operations must be developed and instituted;
3. The marketing effort must be upgraded and increased to inform the public of transit availability and efficiency;

4. Additional equipment such as radios, lift equipped trolleys, lift equipped buses, lift equipped vans, etc., should be acquired;
5. Driver safety, CPR, first aid, and sensitivity courses should be maintained;
6. Transit services for the elderly and disabled should continue to be upgraded as necessary to insure both availability and accessibility in compliance with MART's ADA complementary paratransit plan;
7. Paratransit services provided by MART to social service agency clients should continue to be monitored for coordination of effort;
8. Brokerage programs with Department of Public Health, MassHealth, Department of Mental Health, MRC, MCB, and Department of Developmental Services should be monitored for greater coordination and continued use of private enterprises.
9. MAP Purchases for Elderly and Disabled Services (Section 5310).

The following are recommendations limited to commuter rail operations that likely effect the identified target populations.

- Increase available parking at the Shirley, Ayer and Littleton commuter rail stations.
- Extend train service to Gardner.
- Improve Handicapped accessibility at Shirley and Ayer Train Stations.
- Explore possibility of a regional commuter rail facility in the Devens Enterprise Zone.

Environmental Trends

Climate change impacts such as global warming is expected to increase the frequency of precipitation and severity of weather events. It is important to anticipate the impact of such factors on transportation infrastructure.

Environmental Recommendations

The importance of the environment in the Montachusett region goes beyond just the moral responsibility to protect our planet. Natural resources and attractions which exist in the region could also have economic benefits as well. Both the protection of our environment and the efficient connectivity of people to these assets should play a prominent role in transportation decision making now and in the future. Environmental Performance Measures set in this plan will help ensure progress continues to be made.

Environmental Action Items

1. Encourage the development of more projects which qualify for Congestion Mitigation and Air Quality (CMAQ) funds.
2. Maintain the prevalence of environmental factors when reviewing and prioritizing transportation projects.
3. Continue to monitor and assess vulnerable infrastructures.

Public Input Trends

Through the public outreach process, a number of issues and recommendations were brought forward, either as a direct comment or through plan development and analysis.

The following summarizes the trends discussed through these various meetings and plans. For a more detailed discussion, please contact the MRPC for further information.

- A need for infrastructure improvements to existing facilities as well as potential expansion projects to improve efficiency;
- Environmental issues related to state highways are need to improve issues such as water quality;
- The expansion and development of trails have shown various benefits to the region from economics to health;
- The Complete Streets program and funding opportunities has been embraced by communities;
- Chapter 90 funding levels continue to be a problem for local communities, especially smaller, more rural municipalities;
- Project costs as well as the overall process continue to be an issue;
- Recreational opportunities in the region are a strength to be promoted;
- The quality of the regions educational systems is a strength that should also be promoted;

- The quality of the transportation infrastructure is seen as a weakness from the business and local official perspective;
- The quality of the public transportation system is also seen as a weakness;
- Public transportation is seen as a viable option when and where available, however, reliability, cost effectiveness and operating schedules are major factors affecting their use by students, elderly and disabled individuals.
- Company run shuttles are also seen as an attractive option for employees;
- There is a general consensus that local knowledge of the transit system and all of its available options is a major reason for a lack of use;
- Transportation issues are a major barrier to accessing health care, jobs, social services and healthy foods;
- Prioritize regional target funding to the following categories:
    a. Road Maintenance & Infrastructure
    b. Transit Options
    c. Pedestrian & Bicycle Facilities
    d. Climate Change & Environment
    e. Safety (High Crash Locations)
    f. Congestion Relief
    g. Complete Streets
    h. Regional Access
    i. Community Access

Public Input Action Items

1. Monitor other potential Major Infrastructure Projects that were identified in order to determine feasibility and potential inclusion in future RTP's for the Region. Coordination with MassDOT is needed to determine roles and responsibilities for potential advancement of these projects.
2. Continue to promote the Complete Street Program with local communities and work to assist with applications upon request. Also, promote additional funding to the program by the state in order to address the program's popularity.

3. Along the same lines, continue to impress upon the state the need to increase Chapter 90 funds to local municipalities. In addition, encourage new measures between the state and locals that may improve local control of projects as well as funding costs.
4. Conduct a review of Park & Ride facilities in the Region and examine potential expansion lots and programs. This can be conducted through future Unified Planning Work Programs for the MPO.
5. Work with MART to improve their outreach and advertising efforts related to available services. In addition, continue collaboration with MART to monitor and restructure transit options to meet the needs of an ever changing cliental.
6. Continue efforts to address transportation needs related to economic development issues. Expand work with the Montachusett CEDS committee.
7. Continue to promote participation in the transportation planning effort by traditionally under represented populations. This includes efforts to identify organizations and agencies that are advocates for the diverse populations of the region.
8. Maintain an interaction with MassDOT's Office of Diversity and Civil Right (ODCR) to ensure appropriate compliance with Title VI and EJ requirements in order to maintain a viable program. When necessary, changes and updates to the planning process should be initiated.

Equity Trends

After analyzing the types of projects being implemented, it seems that the majority of highway projects continue to consist of improvements to already existing infrastructure (ex. roadway resurfacing and rehabilitation, and bridge repair) as opposed to building new facilities and therefor do not bear an undue burden or benefit as compared to the rest of the region. These types of projects allow for smoother navigation through these areas (by personal vehicle, bicycling, walking or public transit) and provide improved access for commuting.

The region continues to make strong connections with Title VI and EJ populations through email communication and meeting attendance. This pattern continues to increase yet the return on participation has yet to catch up. It is the hope that participation will show signs of increasing as the connections continue to grow.

Equity Recommendations

The MRPC continues to strive to solicit meaningful participation with Title VI and EJ populations through their Public Participation Plan, Limited English Proficiency Plan, and its submittals to MassDOT and the Federal transportation agencies through the Title VI. For this planning document there was extensive outreach to the EJ and Title VI populations by both daytime and evening meetings with locations along the public transportation routes, contacted public service agencies, online surveys in English and Spanish, and were included as meeting topics during other agency meetings. With that being said, there is always room for improvement.

Equity Action Items

1. Advance the outreach process by making stronger connections with Title VI and Environmental Justice type organizations and individuals.
2. Continue to coordinate with local communities/organizations/advocates to monitor and address issues as they relate to identified target populations.
3. Expand our mailing list to include other Title VI and EJ populations and organizations.
4. Continue to monitor and advocate for TIP projects that show a benefit to Title VI and EJ areas.

Identified Infrastructure Needs

Through the development of this RTP, several projects or needs were identified. Some of these are relatively large in terms of scope, design and cost. The following specifically identified projects will likely entail several years of study, public outreach and design before implementation. These projects are not specifically identified in the financial section because it is not possible to know when funding and project status would allow these investments to be made.

Community	Location	Description
Athol	S. Athol Road Interchange	Access
Athol, Phillipston	Route 2 Lane Addition	Capacity
Fitchburg	Route 31 RR Bridge	Access
Fitchburg	Wachusett Station Improvements	Complete Streets, Access
Fitchburg	John Fitch Highway Stormwater and Complete Streets upgrades.	Complete Streets, Stormwater, GHG
Fithchburg	Route 2 at Mt. Elam Rd.	Safety, GHG
Lancaster	Route 117 at Bolton Flats	Drainage Upgrades
Leominster	Route 190 at Route 2	Capacity, Safety
Leominster	Route 13 Interchange on Route 2	Safety, GHG
Leominster/ Fitchburg	Merriam Ave./ South St. Corridor	Capacity, GHG
Sterling	Route 62 at Route 140	Safety
Westminster	Route 140 at Mile Hill Rd.	Stormwater Upgrades

STATEWIDE TRENDS & RECOMMENDATIONS

Based on the findings established in the *Commission on the Future of Transportation in the Commonwealth, Choices for Stewardship: Recommendations to Meet the Transportation Future Volume 1* report, the following key challenges and recommendations have been identified:

Key Challenges

- Technology, mainly electrified autonomous vehicles and other transportation technologies, are inevitable. According to the study, these new developments "have the potential to improve safety, speed and efficiency, expand mobility options; and reduce greenhouse gas emissions – if they are harnessed property and managed prudently."
- A population that is growing at a rapid rate and is expected to add 600,000 more residents by 2040 will certainly be a challenge. An increasing aging population, in addition to the overall population growth, is even more challenging.
- The transportation system is inequitable. "Those who do not or cannot own or drive a car – due to youth or age, physical or developmental disability, or financial realities – spend more time and money commuting and sometimes simply cannot get where they need to go, especially in the rural and low-density areas."
- Transportation needs vary across the Commonwealth and its communities.
- More trips are made in personal vehicles in which the driver is the only occupant. To operate more efficiently, the transportation system needs to move more people in fewer

vehicles. Increasing the availability and utilization of public transit and increasing the number of vehicles with more than one passenger would assist in this effort.

- Transportation systems are generally driven by development patterns not vice versa. Addressing development and land use patterns will aid in transportation challenges.
- The transportation sector is the largest and fastest growing contributor of GHGs. The goal of the Commonwealth is to reduce overall GHG emissions 80 percent by 2050 and to do so, transportation must play a key role.
- New transportation infrastructure must be well-thought-out with climate change in mind and existing infrastructure will need to be retrofitted over time to withstand sea level rise, more frequent and violent precipitation, and hotter summers.
- Prioritize and pay for needed investments – the Commonwealth must prioritize maintenance, modernization and expansion of its transportation system in order to create, operate and maintain a 21st century transportation system.

Recommendations

"Grouped into five thematic categories, the Commission has made 18 recommendations for how to best prepare Massachusetts' transportation network for the challenges and opportunities of 2040…"

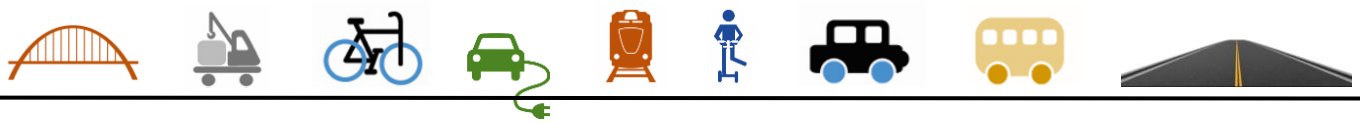
The five thematic categories are:

1. Modernize existing state and municipal transit and transportation assets to more effectively and sustainably move more people throughout a growing Commonwealth:
2. Create a 21st century "mobility infrastructure" that will prepare the Commonwealth and its municipalities to capitalize on emerging changes in transportation technology and behavior;
3. Substantially reduce greenhouse gas emissions from the transportation sector in order to meet the Commonwealth's Global Warming Solutions Act (GWSA) commitments, while also accelerating efforts to make transportation infrastructure resilient to a changing climate;
4. Coordinate and modernize land use, economic development, housing, and transportation policies and investments in order to support resilient and dynamic regions and communities throughout the Commonwealth; and

5. Make changes to current transportation governance and financial structures in order to better position Massachusetts for the transportation system that it needs in the next years and decades.

The 18 recommendations include –

1. Prioritize investment in public transit as the foundation for a robust, reliable, clean and efficient transportation system.
2. Transform roadways and travel corridors to move more people and support changing travel modes and technologies.
3. Work with multiple stakeholders to better manage today's traffic congestion – and the congestion challenges of the future.
4. Establish a Commonwealth Transportation Technology Transformation Initiative (T3I) to promote solutions to our most complicated transportation issues and build upon our reputation in transportation innovation and technology.
5. Support and accelerate efforts to consume transportation differently.
6. Enable and promote a statewide telecommunications infrastructure to support the availability of real-time transportation information and deployment of connected and autonomous vehicles.
7. Develop a long-term strategy for supporting connected and autonomous vehicles in Massachusetts.
8. Enable and promote a ubiquitous electric charging (and/or alternative fuel) infrastructure to support the widespread deployment of electric and autonomous vehicles.
9. Establish a goal that beginning in 2040, all new cars, light duty trucks, and buses sold in Massachusetts will be electric or use another technology that meets the same emissions standards.
10. Collaborate with other Northeast and Mid-Atlantic states to establish a regional, market-based program to reduce transportation sector greenhouse gas (GHG) emissions.
11. Make all current and future critical state and municipal transportation infrastructure resilient to a changing climate.
12. Ensure that sufficient electric capacity is available to provide reliable, clean, and competitively priced power supplies for all electricity users as electrification of the transportation sector accelerates.
13. Adopt land use policies and practices that support more dense, mixed-use, and transit-oriented development (TOD).
14. Use land use, economic development, and transportation policies and investment to enable Gateway Cities and the regions they anchor throughout the Commonwealth to compete for the growing number of residents and jobs.



15. Coordinate the planned reinvention of the MBTA commuter rail system with local, regional, and state land use and economic development strategies to maximize the ridership and economic benefits of the reinvented system.
16. Provide better mobility options in rural communities through reimagined public transportation, community transportation services, and public/private partnerships.
17. Prepare MassDOT and other transportation-related entities to effectively oversee a changing transportation system.
18. Develop a fiscally sound and responsible transportation resource plan to operate, maintain, and upgrade the transportation system.

8 Montachusett Planning Scenarios

MONTACHUSETT PLANNING SCENARIOS

Executive Order No. 579 established the Commission on the Future of Transportation in the Commonwealth. This Commission was charged with examining issues related to transportation in Massachusetts in the year 2040. Five key trends identified for consideration by the Commission included: "changing demographics; a more volatile climate; disruptive technological advances; increased electrification; and a higher level of automation." In response to this Executive Order, the Commission compiled and released a report entitled "*Choices for Stewardship: Recommendations to Meet the Transportation Future*."

MRPC staff reviewed this document during the RTP development. Along with feedback from MassDOT, it was decided to use a scenario planning approach for the Montachusett Region. Subsequently, using the Commission report as a guide and based on trends and data, applicable scenarios were developed for the region.

Massachusetts Commission on the Future of Transportation Planning

As mentioned, part of the state Commission's work, a scenario planning approach was utilized. Scenario planning is used as a tool to describe possible future scenarios/alternatives as a way to consider various future funding options or investments.

Based on a review and analysis of trends in the state and in transportation, four scenarios were developed and considered by the Commission. These scenarios are summarized in the following section.

1. Scenario 1 – Gridlock

Headline - The fast growth of Boston and its surrounding municipalities has continued, but without expansion of existing transportation capacity.

Summary - Jobs and housing continue to grow primarily in the Greater Boston region (GBR). However, employers are frustrated with Boston's high-density commercial and housing environment, and its residents, who once embraced city-oriented life, are discouraged by traffic congestion and unreliable and inconsistent public transit service. Alternatives to SOV travel are not as convenient, reliable, or available as projections had suggested. Investment in active transportation infrastructure is limited and considered supplemental to traditional infrastructure needs. These issues are causing residents and employers to look for opportunities outside of the GBR and the state in general. Other regional job hubs in the state face the same threats as the GBR. Despite Mobility as a Service (MaaS) opportunities inside the core, uneven adoption of transportation technologies and new mobility services exacerbates congestion, GHG emissions, social inequities, and conflicts between public, private, and new mobility transportation services.

2. Scenario 2 – Vibrant Core

Headline - The GBR continues to grow, supported by new transportation technologies and systems that facilitate the success of a vibrant and livable metro region.

Summary - Jobs and housing growth continues primarily in Boston's core and close-in communities, especially those with MBTA service. With employers who still value face-to-face interaction over remote work environments and a society that embraces city-oriented life, the GBR has absorbed most of the state's jobs and population growth while some rural communities located farther away from Boston shrink as they continue to lose population. Many communities in the GBR feature high-density, walkable commercial and housing environments. However, the cost of housing and commercial property pushes some people and businesses to more affordable areas farther from the Boston-centric core, effectively growing the footprint of the urban core to Rt 495 and beyond. The adoption of technology advances in C/AVs, supported by a sophisticated clean energy demand/supply grid, combined with a shared approach to MaaS, support a vibrant, livable, and mobile core on target to meet GHG and related goals. Reliable public transit and micro-mobility options provide trips around the core and beyond.

3. Scenario 3 – Multiple Hubs

Headline - High-density growth takes place in several cities and their regions throughout the Commonwealth. Increased density and expanded mobility options create the opportunity to take advantage of lower cost housing and promotes job creation outside of the GBR core.

Summary - Jobs and housing growth happen in regional hub cities with their own economies, cultural identities, histories, and challenges. This dispersed growth occurs because the GBR and Boston itself is crowded, expensive, vulnerable to extreme weather, and hard to traverse. The commercial and housing development generally concentrates in the core of the regional hub cities and also drives growth in less dense suburbs. In these regions, there is the adoption of C/AV and MaaS with travel by shared rides, and many of the RTAs have come together with the private sector to adapt a new paradigm of serving lower density hubs and travel between them. Outside of these regions, adoption of new transportation technologies and new mobility options is more limited due to longstanding infrastructure challenges and the aging of populations in rural and low-density communities. Because economic development is distributed throughout the state, most rural communities are not far from opportunities for jobs, education, shopping, healthcare, etc. The growth in electric vehicles of all types is supported by a sophisticated clean energy demand/supply grid, which moves the Commonwealth toward meetings its GHG emissions targets and related goals. However, vehicle miles traveled (VMT) has increased as the rise of C/AVs and EVs both incentivize the use of and mitigates some negative impacts of SOV travel.

4. Scenario 4 – Statewide Spread

Headline - Technology has transformed not just transportation but every aspect of people's lives, including work, communication, commerce, and service delivery. This widespread use of technology allows for more choice for those with access to technology, while potentially disadvantaging others.

Summary - Jobs and housing growth are spread across the state in communities of all sizes and types as the importance of physical location has diminished via increased reliance on telecommunications networks. However, reliance on ride and vehicle sharing including MaaS and public transit is low outside of the GBR and other regions with a critical mass of people and jobs which is a result of the marginal cost of running transit service remaining high in those areas against increasingly more affordable C/AVs and EVs. Inside the Greater Boston core, the MBTA has effectively been forced to expand by including new mobility options such as shared rides as well as active transportation options like e-bikes and escooters alongside traditional buses, subways, and paratransit vehicles in order to remain competitive. Climate change makes many areas unviable for residents and businesses but new connections are forged between regions as population spreads out. Social equity is an increased concern as many workers displaced by technology face ongoing high rates of unemployment; and seniors and others with more limited mobility options are "stranded" in place, needing access to affordable housing and transportation to critical services and jobs.

Montachusett Scenario Planning

As previously stated, after a review of scenarios developed by the Commission, staff developed some scenarios based on the general concepts put forward by the Commission but more

applicable to the region's trends and communities. From an analysis of the trends identified in the prior sections of the RTP as well as the stated Vision, Goals, Objectives and Strategies, three different scenarios were compiled. Along with the broader concepts of each scenario, a list of applicable funding options and concepts were also examined. These funding options (or programs) are based upon input derived through the outreach process and detailed in the Public Outreach, Input and Participation chapter of this RTP. By tying program funding options to the scenario concepts, a financial plan can be developed and evaluated. The following chapter of the RTP provides more detailed information regarding the financial analysis conducted for the scenarios. The developed Montachusett scenarios are summarized on the following pages.

Scenario Development Summary

1. Scenarios developed by the Commission on the Future of Transportation in the Commonwealth were reviewed. Trend analysis was also examined to see how they relate to the developed scenarios.
2. Regional trends in demographics and projections were identified. Issues such as an aging population, changes in housing and employment, increases in educational attainment, etc. help to identify needs that must be addressed in order for municipalities and the region to continue to grow and thrive. As an example, the projected slowdown in population, employment and household growth, will need to be addressed by communities as they determine how to best provide access to basic necessities for their residents.

3. An analysis of responses derived from the RTP survey highlight how residents and officials prioritize transportation needs as well as how they characterize their communities now and in the future. The results indicate that the majority of respondents are satisfied with the existing character of their town and wish to see that it is maintained in the future, i.e. a bedroom community now and a bedroom community 25 years from now. This would indicate that large scale expansion of the highway network is not a favorable solution/scenario to address the projected demographic changes. Rather scenarios should make use of the current road networks (with safety and infrastructure upgrades), expand and enhance bike, pedestrian and transit options within and across communities and maintain the regions current characteristics. The question therefore to ask is, "Do municipalities want to stay within their boundaries and provide more opportunities for residents by improved local mobility (Scenario 3 Strong Community Centers) or do they take advantage of established commercial and employment districts in the region by improved long distance mobility (Scenario 2 Multiple Hubs)?"
4. This question, in conjunction with the Regional Vision Statement that seeks to "*provide a multi-modal transportation system that is safe, secure, efficient and affordable to all individuals*" led to the three scenarios developed and outlined in this chapter.

1. Scenario 1 – Status Quo

Scenario 1 relates to the Statewide Scenario 1 – Gridlock in that growth is expected to continue in the Greater Boston region without any expansion of transportation capacity. Within the Montachusett Region, communities will continue the approach of addressing network problems as they arise. Municipalities lack funding that would allow them to pro-actively identify and implement projects in order to offset impacts associated with the growth in the eastern part of the state. Unable to actively fund the needed designs required as part of the project development process in a timely fashion, most communities must allocate funds over several years in order to see one project advance. Consequently, deterioration continues across the transportation networks leading to more complicated and costly improvement projects. This scenario assumes that conditions remain as is, i.e. the "Status Quo."

During the TIP process, projects continue to be funded as in previous years. An examination of Federal Aid eligible Target projects from FFY 2010 to 2020, when categorized along the same lines as the RTP survey descriptions, shows that of the $163.5 million programmed, approximately 66% went towards Road Maintenance & Infrastructure, 13% towards Safety and 11% towards Pedestrian & Bicycle Facilities. No funds were defined as supporting, Transit Options and Regional or Community Access.

Average Percent of Total Funding Per Category FFY 2010 to FFY 2020		
Road Maintenance & Infrastructure	$107,666,164	65.83%
Safety (High Crash Locations)	$20,999,284	12.84%
Pedestrian & Bicycle Facilities	$17,392,242	10.63%
Complete Streets	$9,744,916	5.96%
Climate Change & Environment	$4,248,888	2.60%
Congestion Relief	$3,494,626	2.14%
Transit Options		
Regional Access		
Community Access		
Totals	**$163,546,120**	**100.00%**

Montachusett Region - Scenario 1 Status Quo Summary

Headline - Population and household growth continue while employment continues to decline in the Montachusett Region. No changes or expansions are planned or made to the existing transportation systems.

Description - By 2040 employment has declined across the region as employers find in difficult to attract perspective workers due to limited commercial options. Households increase as a result of the advantages housing costs of the Montachusett Region and the commuter rail option offered by the MBTA Fitchburg Commuter Rail line. The problems associated with the existing system remain as any growth adds to current congestion, safety and accessibility issues.

Highlights

- Job declines continue as state growth is concentrated in the Greater Boston area.
- Alternatives to single occupancy vehicle (SOV) travel like ride-sharing and vehicle-sharing are not as convenient, reliable, or available.
- Investment in active transportation infrastructure is limited and considered supplemental to traditional infrastructure needs.
- The population of some rural towns and cities may shrink as they lose working age population.

Transportation Investments – Projects and investments in the entire transportation and transit network remain relatively unplanned. Projects are developed and prioritized as problems within the system arise. The region continues to try to play "catch-up" to various deteriorating conditions. As a result, little progress is made in the overall performance of the various components of the network.

2. Scenario 2 – Multiple Hubs

This Scenario assumes that within the Montachusett Region, the municipalities that are the current major commercial, industrial and employment centers continue in that role much like Scenario 3 developed by the MA Future Transportation Commission. As growth spreads from the Boston region, communities expand their housing options and seek to retain their rural, small community characteristics and lifestyles. In order to do this, they will seek to improve and expand their connections to the existing commercial and employment centers or "regional hubs." Thus, the focus is on "**inter-community"** connections, i.e. longer distance roads and networks that facilitate travel between communities. This assists residents as they seek out employment or goods but still maintain the "laid back" rural lifestyle.

Transportation funding under this Scenario puts a greater emphasis on improving and maintaining their long distance, major roads and networks. Roads such as Route 12, Route 119, etc. facilitate the flow of residents to jobs and goods, therefore, the need to keep these "inter-community" networks efficient and viable.

As defined in the Public Outreach, Input and Participation chapter of this RTP, a preferred emphasis of Montachusett Federal Aid Target funds was derived as follows:

	Funding Percentage Per Strategy Federal Aid Target Funds MRPC Communities	%
1	Road Maintenance & Infrastructure	40%
2	Transit Options	14%
3	Pedestrian & Bicycle Facilities	12%
4	Safety (High Crash Locations)	9%
5	Climate Change & Environment	6%
6	Congestion Relief	4%
7	Complete Streets	5%
8	Regional Access	5%
9	Community Access	4%
10	Other	1%

To advance projects that would meet the needs of Scenario 2, each of the listed funding strategy can then be broken down further to ensure a majority of the strategy funds goes towards advancing "inter-community" projects and networks. This results in a funding strategy for Scenario 2 as follows:

	Funding Percentage Per Strategy Federal Aid Target Funds Scenario 2 – Multiple Hubs	Total Allocation % to Funding Category	Allocated % Funding Towards Inter Community Network	Allocated % Towards Remaining Projects
1	Road Maintenance & Infrastructure	40%	30%	10%
2	Transit Options	14%	10%	4%
3	Pedestrian & Bicycle Facilities	12%	10%	2%
4	Safety (High Crash Locations)	9%	7%	2%
5	Climate Change & Environment	6%	4%	2%
6	Congestion Relief	4%	3%	1%
7	Complete Streets	5%	3%	2%
8	Regional Access	5%	5%	0%
9	Community Access	4%	4%	0%
10	Other	1%	1%	0%

Projects or Federal funding categories that can meet these identified strategies include but are not limited to the following types:

Strategy	Project Funding or Type
Road Maintenance & Infrastructure	STBG • Resurfacing • Rehabilitation • Full Depth Reconstruction • Box Widening • Geometric Improvements
Safety	HSIP • Signal Installation/Upgrade • Roundabout Construction • Pavement Markings/Signage • Guardrails • Geometric Improvements
Pedestrian & Bicycle Facilities	TAP • Trail Construction - On & Off Street • Sidewalks • Benches & Bike Racks/Shelters • Trail Signage & Markings
Complete Streets	STBG • Widening for Bike & Ped Lanes • Sidewalks • Crosswalks • Ped Signals • ADA Upgrades & Improvements
Climate Change & Environment	CMAQ • Congestion Reduction • Air Quality Improvements • Signal Re-Timing • Stormwater Runoff • Drainage Improvements • Catch Basin Installation

Strategy	Project Type
Congestion Relief	• Intersection Improvements • Corridor Improvements • Interchange Upgrades • Signal Re-Timing
Transit Options	• On Street Bus Cutouts • Sidewalk Improvements on/to Bus Routes • Sidewalk Improvements on/to Commuter Rail • ADA Access Improvement • Rolling Stock (Bus/Van)
Regional Access	• Major Highway Resurfacing/Improvements • Signage Upgrades • Accel/Deccell Lane Improvements
Community Access	• Signage Upgrades • Resurfacing • Geometric Improvements • Sidewalks
Other	• Safe Routes to School

Montachusett Region - Scenario 2 Multiple Hubs Summary

Headline - Growth takes place across the Montachusett Region as well as throughout the Commonwealth. Expanded mobility options create the opportunity to take advantage of housing costs and expanded markets outside of the Greater Boston core which includes Montachusett Region cities and towns. The region's larger, more urban communities, i.e. Fitchburg, Leominster, Gardner, Athol and Clinton, remain the major commercial and employment destinations for the more rural communities. Longer distance commutes to Boston and Worcester continue.

Description - More dispersed growth occurs in the Montachusett Region because Greater Boston, and Boston itself, is crowded, expensive, vulnerable to extreme weather, and difficult travel. Greater Worcester also shares similar traits to a lesser extent. This results in Montachusett Region cities being transformed into regional hub cities and several towns into hub towns. This is also due to the supply of relatively affordable business and residential real estate in relation to Greater Boston and Greater Worcester. As a result, travel between communities and regional hubs are an emphasis area for transportation investments in order to facilitate **inter-community** movement.

Highlights

- Job and housing growth occur in the Montachusett Region hub cities, and rural towns due to:
- Expanded mobility options.
- The significant and relatively higher congestion and cost of living in the Greater Boston and Greater Worcester regions.
- Their own economies, cultural identities, histories, and challenges.
- In the Montachusett Region, Connected and Autonomous vehicles (C/AV) with travel by shared rides is adopted. The RTA has joined with the private sector to serve lower density towns and the travel between them. However, challenges remain due to the infrastructure and the aging population.
- Because economic development is concentrated among the larger hub cities throughout the Montachusett Region, rural towns within the Montachusett Region are not far from opportunities for jobs, education, shopping, healthcare, etc.
- The growth in electric vehicles of all types is supported.
- The commercial and housing development generally concentrates in the Montachusett Region hub cities and helps to drive growth in neighboring towns.

Transportation Investments – Projects and investments are developed based upon results from the RTP development process that prioritized investments with MPO target funds in the following breakdown:

Funding Program Category	Percent of Target Funds to Allocate	Percent to Sub Allocate to INTER-Community Facilities
Road Maintenance & Infrastructure	40%	21% plus
Transit Options	14%	8% plus
Pedestrian & Bicycle Facilities	12%	7% plus
Climate Change & Environment	6%	4% plus
Safety (High Crash Locations)	9%	5% plus
Congestion Relief	4%	2% plus
Complete Streets	5%	3% plus
Regional Access	5%	5%
Community Access	4%	4%
Other (TBD)	1%	1%

For further detail on the development of the prioritized categories, please refer to the Public Input and Financial chapters of this report.

To facilitate movement between rural towns and hub centers, additional emphasis within the funding categories is placed on long distance **inter-community** roads, facilities and transit options. As an example: within the Road Maintenance & Infrastructure program, 40% of available target funds are allocated to these types of projects and within this category the majority of this 40% is then sub allocated to the identified **inter-community** facilities. These facilities include, but are not limited to:

- Road ways such as Routes 12, 13, 68, 117, 119, 140, 202, etc.;
- Trails that reach across municipalities and allow for long distance travel;
- Transit connections to and from rural towns and commuter rail facilities;
- Fixed route connections to commercial and employment centers to and from rural towns;
- Safety and congestion improvements along these routes and within hub communities.

As a result, progress is made in the overall performance of the various components of the network and corresponding improvements in housing costs, population retention and employment are seen as travel is more efficient.

3. Scenario 3 – Strong Community Centers

Scenario 3 assumes that each community within the Montachusett Region would seek to grow and enhance their own particular municipality through the improvement of transportation networks within their boundaries. Emphasis would be place on developing a strong town center area or destination that supports the commercial and employment needs of their citizens. As in the prior scenario, growth spreads from the Boston region and communities seek to expand their housing and employment options in order to attract new residents and retain their current ones.

To do this, transportation investments focus on **"intra-community"** facilities rather than those systems that would take individuals out of the community to shop, work, etc. By prioritizing the travel needs within their existing borders, strong town or community centers can be obtained.

As with Scenario 2, this Scenario would also make use of the preferred emphasis of Montachusett Federal Aid Target funds as outlined above, i.e. the emphasis funding categories and their percent of emphasis remain the same.

	Funding Percentage Per Strategy Federal Aid Target Funds MRPC Communities	%
1	Road Maintenance & Infrastructure	40%
2	Transit Options	14%
3	Pedestrian & Bicycle Facilities	12%
4	Safety (High Crash Locations)	9%
5	Climate Change & Environment	6%
6	Congestion Relief	4%
7	Complete Streets	5%
8	Regional Access	5%
9	Community Access	4%
10	Other	1%

To advance the projects that meet the needs of Scenario 3, each of the listed and identified funding strategies are broken down further to ensure a majority of the strategy funds goes towards advancing "intra-community" projects and networks. This results in a funding strategy for Scenario 3 similar to Scenario 2. The difference would be seen in the TIP process by the types of projects prioritized and funded.

	Funding Percentage Per Strategy Federal Aid Target Funds Scenario 2 – Multiple Hubs	Total Allocation % to Funding Category	Allocated % Funding Towards Inter Community Network	Allocated % Towards Remaining Projects
1	Road Maintenance & Infrastructure	40%	30%	10%
2	Transit Options	14%	10%	4%
3	Pedestrian & Bicycle Facilities	12%	10%	2%
4	Safety (High Crash Locations)	9%	7%	2%
5	Climate Change & Environment	6%	4%	2%
6	Congestion Relief	4%	3%	1%
7	Complete Streets	5%	3%	2%
8	Regional Access	5%	5%	0%
9	Community Access	4%	4%	0%
10	Other	1%	1%	0%

Again, the types of projects and Federal funding categories that meet the goals of Scenario 3 include but are not limited to the following:

Strategy	Project Funding or Type
Road Maintenance & Infrastructure	STBG • Resurfacing • Rehabilitation • Full Depth Reconstruction • Box Widening • Geometric Improvements
Safety	HSIP • Signal Installation/Upgrade • Roundabout Construction • Pavement Markings/Signage • Guardrails • Geometric Improvements
Pedestrian & Bicycle Facilities	TAP • Trail Construction - On & Off Street • Sidewalks • Benches & Bike Racks/Shelters • Trail Signage & Markings
Complete Streets	STBG • Widening for Bike & Ped Lanes • Sidewalks • Crosswalks • Ped Signals • ADA Upgrades & Improvements
Climate Change & Environment	CMAQ • Congestion Reduction • Air Quality Improvements • Signal Re-Timing • Stormwater Runoff • Drainage Improvements • Catch Basin Installation

Strategy	Project Type
Congestion Relief	• Intersection Improvements • Corridor Improvements • Interchange Upgrades • Signal Re-Timing
Transit Options	• On Street Bus Cutouts • Sidewalk Improvements on/to Bus Routes • Sidewalk Improvements on/to Commuter Rail • ADA Access Improvement • Rolling Stock (Bus/Van)
Regional Access	• Major Highway Resurfacing/Improvements • Signage Upgrades • Accel/Deccell Lane Improvements
Community Access	• Signage Upgrades • Resurfacing • Geometric Improvements • Sidewalks
Other	• Safe Routes to School

Montachusett Region - Scenario 3 Strong Community Centers Summary

Headline - Growth takes place across the Montachusett Region as well as throughout the Commonwealth. Expanded mobility options create the opportunity to take advantage of housing costs and expanded markets outside of the Greater Boston core which includes Montachusett Region cities and towns. The region's communities take advantage of these conditions by seeking to upgrade and improve travel within their communities and in particular to their town centers which are typically the major commercial and employment centers.

Description - More dispersed growth occurs in the Montachusett Region because Greater Boston, and Boston itself, is crowded, expensive, vulnerable to extreme weather, and difficult travel. Greater Worcester also shares similar traits to a lesser extent. This results in Montachusett Region municipalities improving mobility within their communities in order to

foster growth in housing, commercial and where appropriate employment centers. Improved, safer **intra-community** networks result in a more vibrant town center for all populations. Travel within communities is an emphasis area for transportation investments in order to facilitate and continue community growth.

Highlights

- Job and housing growth occur in the Montachusett Region cities, and towns due to:
- Expanded mobility options within the communities.
- The significant and relatively higher congestion and cost of living in the Greater Boston and Greater Worcester regions.
- Their own economies, cultural identities, histories, and challenges.
- The RTA has joined with the private sector to serve lower density towns. However, challenges remain due to the infrastructure and the cost of service start-up and operation.
- In the Montachusett Region, Connected and Autonomous vehicles (C/AV) are limited, especially in the smaller communities.
- Modes such as walking and bicycling are enhanced and gain in popularity as sidewalks, trails and streets are improved.
- Expansion of Safe Routes to School are seen as walking/biking connections to community schools are promoted.
- Travel by shared rides is adopted.
- Because **intra-community** access is improved, economic development is spread throughout the Montachusett Region. Rural towns within the region now have more opportunities for jobs, education, shopping, healthcare, etc.
- The growth in electric vehicles of all types is supported.
- Commercial and housing development is seen throughout Montachusett Region.

Transportation Investments – Projects and investments are developed based upon results from the RTP development process that prioritized investments with MPO target funds in the following breakdown:

Funding Program Category	Percent of Target Funds to Allocate	Percent to Sub Allocate to INTRA - Community Facilities
Road Maintenance & Infrastructure	40%	21% plus
Transit Options	14%	8% plus
Pedestrian & Bicycle Facilities	12%	7% plus
Climate Change & Environment	6%	4% plus
Safety (High Crash Locations)	9%	5% plus
Congestion Relief	4%	2% plus
Complete Streets	5%	3% plus
Regional Access	5%	5%
Community Access	4%	4%
Other (TBD)	1%	1%

For further detail on the development of the prioritized categories, please refer to the Public Input and Financial chapters of this report.

To facilitate movement through a community and towards the town center, additional emphasis within the funding categories is placed on what are considered as **intra-community** roads, facilities and transit options. This would be the opposite of the prior scenario, i.e. shorter travel networks and options. Again, as an example: within the Road Maintenance & Infrastructure program, 40% of available target funds are allocated to these types of projects and then within this category the majority of this 40% is then sub allocated to the identified **intra-community** facilities. These projects include, but are not limited to:

- Sidewalk connections to the town center;
- ADA improvements within the community;
- Safety improvements at locations in a community that might impact local travel patterns;
- Road projects on eligible travel ways such as Routes 12, 13, 68, 117, 119, 140, 202, etc. but with short project limits;
- Trails that improve access within the community and to local commercial, municipal or employment centers;
- Transit/ride share options for community residents to facilities in the municipality, such as medical and commercial locations;
- Transit connections to and from rural towns and commuter rail facilities remain a area of interest and when possible emphasis.

As a result, progress is made in the performance of the community's transportation network along with a corresponding improvement in housing costs and population retention as the community becomes more attractive and easier to navigate for its residents.

Conclusion

The development of future planning scenarios for the Montachusett Region are focused on two options that emphasize how local communities will work to meet their future demands. Expected continued growth in the Greater Boston area, along with current demographic trends, should provide municipalities with the continued potential to grow and expand. How this growth is managed is reflected in Scenarios 2, Multiple Hubs, and Scenario 3, Strong Community Centers. Both scenarios allow the communities to grow but they differ on how it is managed. Project priorities differ but the funding allocations and categories are consistent between the two scenarios.

Scenario 2 seeks to promote and emphasize the longer transportation networks that connect one town to another. This promotes inter (or between) community access at the cost of the in-town transportation networks.

Scenario 3 places the priority on projects that promote travel within (or intra) the community. An emphasis on funding a shorter more contained transportation network promotes a more vibrant town center.

Action related to the advancement of these scenarios would occur as part of project development process by the municipalities and within the TIP (Transportation Improvement Program) prioritization and development process.

9 Air Quality Determination

Montachusett MPO

AIR QUALITY CONFORMITY DETERMINATION – MONTACHUSETT MPO

This section documents the latest air quality conformity determination for the 1997 ozone National Ambient Air Quality Standards (NAAQS) in the Montachusett Region. It covers the applicable conformity requirements according to the latest regulations, regional designation status, legal considerations, and federal guidance. Further details and background information are provided below:

Introduction

The 1990 Clean Air Act Amendments (CAAA) require metropolitan planning organizations within nonattainment and maintenance areas to perform air quality conformity determinations prior to the approval of Long-Range Transportation Plans (LRTPs) and Transportation Improvement Programs (TIPs), and at such other times as required by regulation. Clean Air Act (CAA) section 176(c) (42 U.S.C. 7506(c)) requires that federally funded or approved highway and transit activities are consistent with ("conform to") the purpose of the State Implementation Plan (SIP). Conformity to the purpose of the SIP means that means Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding and approvals are given to highway and transit activities that will not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or any interim milestones (42 U.S.C. 7506(c)(1)). EPA's transportation conformity rules establish the criteria and procedures for determining whether metropolitan transportation plans, transportation improvement programs (TIPs), and federally supported highway and transit projects conform to the SIP (40 CFR Parts 51.390 and 93).

A nonattainment area is one that the U.S. Environmental Protection Agency (EPA) has designated as not meeting certain air quality standards. A maintenance area is a nonattainment area that now meets the standards and has been re-designated as maintaining the standard. A conformity determination is a demonstration that plans, programs, and projects are consistent with the State Implementation Plan (SIP) for attaining the air quality standards. The CAAA requirement to

perform a conformity determination ensures that federal approval and funding go to transportation activities that are consistent with air quality goals.

RTP Legislative and Regulatory Background

The entire Commonwealth of Massachusetts was previously classified as nonattainment for ozone, and was divided into two nonattainment areas. The Eastern Massachusetts ozone nonattainment area included Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester counties. Berkshire, Franklin, Hampden, and Hampshire counties comprised the Western Massachusetts ozone nonattainment area. With these classifications, the 1990 Clean Air Act Amendments (CAAA) required the Commonwealth to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), the two major precursors to ozone formation to achieve attainment of the ozone standard.

The 1970 Clean Air Act defined a one-hour national ambient air quality standard (NAAQS) for ground-level ozone. The 1990 CAAA further classified degrees of nonattainment of the one-hour standard based on the severity of the 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.The attainment date was later extended, first to 2003 and a second time to 2007.

In 1997, the EPA proposed a new, eight-hour ozone standard that replaced the one- hour standard, effective June 15, 2005. Scientific information had shown that ozone could affect human health at lower levels, and over longer exposure times than one hour. The new standard was challenged in court, and after a lengthy legal battle, the courts upheld it. It was finalized in June 2004.The eight-hour standard is 0.08 parts per million, 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 the eight-hour values. Massachusetts as a whole was classified as being in moderate nonattainment for the eight-hour standard, and was separated into two nonattainment areas—Eastern Massachusetts and Western Massachusetts.

In March 2008, EPA published revisions to the eight-hour ozone NAAQS establishing a level of 0.075 ppm, (March 27, 2008; 73 FR 16483). In 2009, EPA announced it would reconsider this standard because it fell outside of the range recommended by the Clean Air Scientific Advisory Committee. However, EPA did not take final action on the reconsideration so the standard would remain at 0.075 ppm.

After reviewing data from Massachusetts monitoring stations, EPA sent a letter on December 16, 2011 proposing that only Dukes County would be designated as nonattainment for the new proposed 0.075 ozone standard. Massachusetts concurred with these findings.

On May 21, 2012, (77 FR 30088), the final rule 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 published on May 21, 2012 (77 FR 30160), revoked the 1997 ozone NAAQS to occur one year after the July 20, 2012 effective date of the 2008 NAAQS.

Also, on May 21, 2012, the air quality designations areas for the 2008 NAAQS were published in the Federal Register. In this Federal Register, the only area in Massachusetts that was designated as nonattainment is Dukes County. All other Massachusetts counties were designated as attainment/unclassified for the 2008 standard. 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 confirmed the removal of transportation conformity to the 1997 Ozone NAAQS.

However, on February 16, 2018, the United States Court of Appeals for the District of Columbia Circuit in *South Coast Air Quality Mgmt. District v. EPA* ("*South Coast II*," 882 F.3d 1138) held that transportation conformity determinations must be made in areas that were either nonattainment or maintenance for the 1997 ozone NAAQS and attainment for the 2008 ozone NAAQS when the 1997 ozone NAAQS was revoked. These conformity determinations are required in these areas after February 16, 2019. On November 29, 2018, EPA issued *Transportation Conformity Guidance for the South Coast II Court Decision* (EPA-420-B-18-050, November 2018) that addresses how transportation conformity determinations can be made in

areas. According to the guidance, both Eastern and Western Massachusetts, along with several other areas across the country, are now defined as "orphan nonattainment areas" – areas that were designated as nonattainment for the 1997 ozone NAAQS at the time of its revocation (80 FR 12264, March 6, 2015) and were designated attainment for the 2008 ozone NAAQS in EPA's original designations rule for this NAAQS (77 FR 30160, May 21, 2012).

Current Conformity Determination

After 2/16/19, as a result of the court ruling and the subsequent federal guidance, transportation conformity for the 1997 NAAQS – intended as an "anti-backsliding" measure – now applies to both of Massachusetts' orphan areas. Therefore, this conformity determination is being made for the 1997 ozone NAAQS on the Montachusett FFY 2020-2024 Transportation Improvement Program and 2020-2040 Regional Transportation Plan.

The transportation conformity regulation at 40 CFR 93.109 sets forth the criteria and procedures for determining conformity. The conformity criteria for TIPs and RTPs include: latest planning assumptions (93.110), latest emissions model (93.111), consultation (93.112), transportation control measures (93.113(b) and (c), and emissions budget and/or interim emissions (93.118 and/or 93.119).

For the 1997 ozone NAAQS areas, transportation conformity for TIPs and RTPs for the 1997 ozone NAAQS can be demonstrated without a regional emissions analysis, per 40 CFR 93.109(c). This provision states that the regional emissions analysis requirement applies one year after the effective date of EPA's nonattainment designation for a NAAQS and until the effective date of revocation of such NAAQS for an area. The 1997 ozone NAAQS revocation was effective on April 6, 2015, and the *South Coast II* court upheld the revocation. As no regional emission analysis is required for this conformity determination, there is no requirement to use the latest emissions model, or budget or interim emissions tests.

Therefore, transportation conformity for the 1997 ozone NAAQS for the Montachusett FFY 2020-2024 Transportation Improvement Program and 2020-2040 Regional Transportation Plan can be demonstrated by showing that remaining requirements in Table 1 in 40 CFR 93.109 have been

met. These requirements, which are laid out in Section 2.4 of EPA's guidance and addressed below, include:

- Latest planning assumptions (93.110)
- Consultation (93.112)
- Transportation Control Measures (93.113)
- Fiscal Constraint (93.108)

Latest Planning Assumptions:

The use of latest planning assumptions in 40 CFR 93.110 of the conformity rule generally apply to regional emissions analysis. In the 1997 ozone NAAQS areas, the use of latest planning assumptions requirement applies to assumptions about transportation control measures (TCMs) in an approved SIP (See following section on Timely Implementation of TCMs).

Consultation:

The consultation requirements in 40 CFR 93.112 were addressed both for interagency consultation and public consultation. Interagency consultation was conducted with FHWA, FTA, US EPA Region 1, MassDEP, and the other Massachusetts MPOs, with the most recent conformity consultation meeting held on March 6, 2019 (this most recent meeting focused on understanding the latest conformity-related court rulings and resulting federal guidance). This ongoing consultation is conducted in accordance with the following:

- Massachusetts' Air Pollution Control Regulations 310 CMR 60.03 "Conformity to the State Implementation Plan of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 USC or the Federal Transit Act"

- The Commonwealth of Massachusetts Memorandum of Understanding by and between Massachusetts Department of Environmental Protection, Massachusetts Executive Office of Transportation and Construction, Massachusetts Metropolitan Planning Organizations concerning the conduct of transportation-air quality planning in the development and implementation of the state implementation plan" (note: this MOU is

currently being updated)

Public consultation was conducted consistent with planning rule requirements in 23 CFR 450.

Title 23 CFR Section 450.324 and 310 CMR 60.03(6)(h) requires that the development of the TIP, RTP, and related certification documents provide an adequate opportunity for public review and comment. Section 450.316(b) also establishes the outline for MPO public participation programs. The Montachusett MPO's Public Participation Plan was formally adopted in 2016 and subsequently amended in 2017. The Public Participation Plan ensures that the public will have access to the RTP and all supporting documentation, provides for public notification of the availability of the RTP and the public's right to review the document and comment thereon, and provides a 21-day public review and comment period prior to the adoption of the RTP and related certification documents. The Montachusett MPO's Public Participation Plan is available for review and download from the MRPC website (www.mrpc.org) under the Reports and Documents page or at Montachusett MPO PPP w/Amendment #1 March 15 2017.

The public comment period for this conformity determination commenced on June 25, 2019. During the 21-day public comment period, any comments received were incorporated into this Plan. This allowed ample opportunity for public comment and MPO review of the draft document. The public comment period will close on July 15, 2019 and subsequently, the Montachusett MPO is expected to endorse this air quality conformity determination on July 17, 2019. These procedures comply with the associated federal requirements.

Timely Implementation of Transportation Control Measures:

Transportation Control Measures (TCMs) have been required in the SIP in revisions submitted to EPA in 1979 and 1982. All SIP TCMs have been accomplished through construction or through implementation of ongoing programs. All of the projects have been included in the Region's Transportation Plan (present of past) as recommended projects or projects requiring further study.

DEP submitted to EPA its strategy of programs to show Reasonable Further Progress of a 15% reduction of VOCs in 1996 and the further 9% reduction of NOx toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999. Within that strategy there are no specific TCM projects. The strategy does call for traffic flow improvements to reduce congestion and, therefore, improve air quality. Other transportation-related projects that have been included in the SIP control strategy are listed below:

- *Enhanced Inspection and Maintenance Program*
- *California Low Emission Vehicle Program*
- *Reformulated Gasoline for On- and Off-Road Vehicles*
- *Stage II Vapor Recovery at Gasoline Refueling Stations*
- *Tier I Federal Vehicle Standards*

Fiscal Constraint:

Transportation conformity requirements in 40 CFR 93.108 state that TIPs and transportation plans and must be fiscally constrained consistent with DOT's metropolitan planning regulations at 23 CFR part 450. The Montachusett 2020-2024 Transportation Improvement Program and 2020-2040 Regional Transportation Plan are fiscally constrained, as demonstrated in in the Financial section of this document.

In summary and based upon the entire process described above, the Montachusett MPO has prepared this conformity determination for the 1997 Ozone NAAQS in accordance with EPA's and Massachusetts' latest conformity regulations and guidance. This conformity determination process demonstrates that the FFY 2020-2024 Transportation Improvement Program and the 2020-2040 Regional Transportation Plan meet the Clean Air Act and Transportation Conformity Rule requirements for the 1997 Ozone NAAQS, and have been prepared following all the guidelines and requirements of these rules during this time period.

Therefore, the implementation of the Montachusett MPO's FFY 2020-2024 Transportation Improvement Program and the 2020-2040 Regional Transportation Plan are consistent with the air quality goals of, and in conformity with, the Massachusetts State Implementation Plan.

Evaluation and Reporting of Statewide Greenhouse Gas Reductions in Transportation

This section documents recent progress made by MassDOT and the MPOs in working to help achieve greenhouse gas (GHG) reduction goals as outlined in state regulations applicable to Massachusetts. This "progress report" estimates future carbon dioxide (CO_2) emissions from the transportation sector as part of meeting the GHG reduction goals established through the Commonwealth's Global Warming Solutions Act (GWSA).

GWSA Transportation Status: Future Carbon Dioxide Emissions Reductions

The Global Warming Solutions Act of 2008 requires statewide reductions in greenhouse gas (CO2) emissions of 25 percent below 1990 levels by the year 2020, and 80 percent below 1990 levels by 2050.

The Commonwealth's thirteen metropolitan planning organizations (MPOs) are 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, and 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 each MPO to evaluate and report the aggregate GHG emissions and impacts of both its Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP).

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 is being achieved through the transportation goals and policies contained in the 2020 RTPs, the major projects planned in the RTPs, and the mix of new transportation projects that are programmed and implemented through the TIPs.

The GHG evaluation and reporting processes enable the MPOs and MassDOT 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 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 “sustainable” transportation 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)

Regional GHG Evaluation and Reporting in RTPs

MassDOT coordinated with MPOs and regional planning agency (RPA) staffs on the implementation of GHG evaluation and reporting in development of each MPO's 2012 and 2016 RTPs. This collaboration has continued for the MPOs' 2020 RTPs and 2020-24 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, as a supplement to the 2020 RTPs. Using the newly updated statewide travel demand model, GHG emissions have been projected for 2020 no-build (base) and build (action) conditions, and for 2040 no-build (base) and build (action) conditions (see the chart in this section for the results of this modeling).

All of the MPOs have addressed GHG emission reduction projections in their RTPs (including the statewide estimates in the chart that follows), along with a discussion of climate change and a statement of MPO support for reducing GHG emissions from transportation as a regional goal.

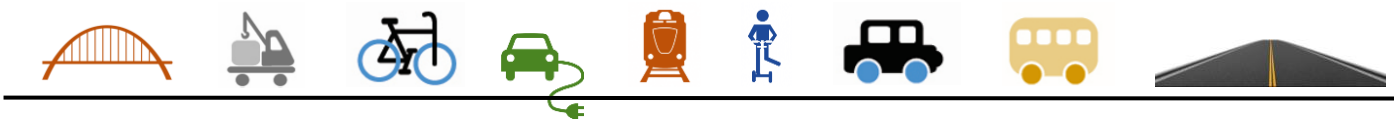
MassDOT's statewide estimates of CO_2 emissions resulting from the collective list of all recommended projects in all of the Massachusetts RTPs combined are presented in the table below. Emissions estimates incorporate the latest planning assumptions including updated socio-economic projections consistent with the 2020 RTPs:

Massachusetts Statewide Aggregate CO_2 Estimated Emissions Impacts from Transportation

(all emissions in tons per summer day)

Year	CO_2 Action Emissions	CO_2 Base Emissions	Difference (Action – Base)
2016	86,035.6	86,035.6	n/a
2020	75,675.6	75,865.9	-190.3
2040	54,484.2	54,702.2	-218.0

This analysis includes only those larger, regionally significant projects that are included in the statewide travel demand model. Many other types of projects that cannot be accounted for in the model (such as bicycle and pedestrian facilities, shuttle services, intersection improvements, etc.), are covered in each MPO region's RTP with either "qualitative" assessments of likely CO_2 change, or actual quantitative estimates listed for each project.



As shown above, collectively, all the projects in the RTPs in the 2020 Action scenario provide a statewide reduction of over 190 tons of CO_2 per day compared to the base case. The 2040 Action scenario estimates a reduction of 218 tons per day of CO_2 emissions compared to the base case.

These results demonstrate that the transportation sector is expected to continue making positive progress in contributing to the achievement of GHG reduction targets consistent with the requirements of the GWSA. MassDOT and the MPOs will continue to advocate for steps needed to accomplish the Commonwealth's long-term goals for greenhouse gas reductions.

10 Financial Analysis

FINANCIAL ANALYSIS

Introduction

Federal regulations regarding Regional Transportation Plans require that a financial analysis be included that examines the anticipated needs of the Region with reasonably expected federal and state funds. This chapter outlines the development of those funding estimates and determines if the Montachusett RTP is fiscally constrained.

Expected Funding – Highway

To assist in the development of the financial component of the RTP, the Massachusetts Department of Transportation (MassDOT) Office of Transportation Planning (OTP) developed highway funding estimates for the life span of the document, i.e. to the year 2040. Federal and state highway funding estimates were developed in five-year increments. Data was provided for the entire Commonwealth as well as for each particular MPO. Refer to Table 10-1 below.

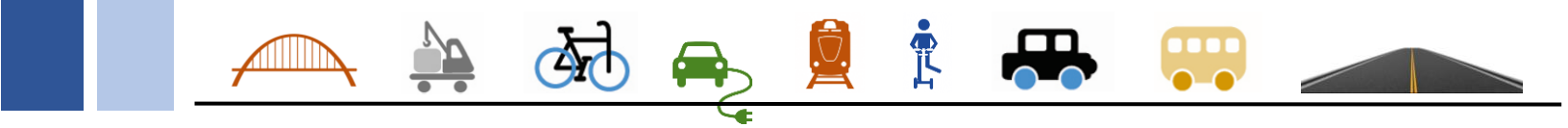


Table 10-1. Massachusetts Funding Estimates FFY 2020 to 2040

	Base OA in today's dollars w/2.2% increase starting in 2025	August redistribution	Base OA + August Redistribution	GANs repayment	Funding less GANs repayments	Funding w/ non-federal match	Statewide Items	Funding available for MPOs
2020	$626,330,019	$50,000,000	$676,330,019	$81,570,000	$594,760,019	$743,450,024	$504,945,083	$238,504,940
2021	$641,988,270	$50,000,000	$691,988,270	$85,190,000	$606,798,270	$758,497,838	$515,165,433	$243,332,404
2022	$658,744,163	$50,000,000	$708,744,163	$89,590,000	$619,154,163	$773,942,704	$525,655,458	$248,287,245
2023	$676,662,005	$50,000,000	$726,662,005	$93,985,000	$632,677,005	$790,846,256	$537,136,211	$253,710,045
2024	$689,684,333	$50,000,000	$739,684,333	$98,715,000	$640,969,333	$801,211,666	$544,176,311	$257,035,355
2025	$704,857,388	$50,000,000	$754,857,388	$103,650,000	$651,207,388	$814,009,235	$552,868,314	$261,140,921
2026	$720,364,251	$50,000,000	$770,364,251	$108,835,000	$661,529,251	$826,911,564	$561,631,468	$265,280,095
2027	$736,212,264	$50,000,000	$786,212,264	$86,302,372	$699,909,893	$874,887,366	$594,216,235	$280,671,131
2028	$752,408,934	$50,000,000	$802,408,934	$86,302,372	$716,106,563	$895,133,203	$607,967,039	$287,166,164
2029	$768,961,931	$50,000,000	$818,961,931	▲ GANs conclude	$818,961,931	$1,023,702,413	$695,290,179	$328,412,234
2030	$785,879,093	$50,000,000	$835,879,093		$835,879,093	$1,044,848,867	$709,652,675	$335,196,192
2031	$803,168,433	$50,000,000	$853,168,433		$853,168,433	$1,066,460,542	$724,331,145	$342,129,397
2032	$820,838,139	$50,000,000	$870,838,139		$870,838,139	$1,088,547,674	$739,332,542	$349,215,132
2033	$838,896,578	$50,000,000	$888,896,578		$888,896,578	$1,111,120,722	$754,663,969	$356,456,753
2034	$857,352,303	$50,000,000	$907,352,303		$907,352,303	$1,134,190,378	$770,332,688	$363,857,691
2035	$876,214,053	$50,000,000	$926,214,053		$926,214,053	$1,157,767,567	$786,346,118	$371,421,448
2036	$895,490,762	$50,000,000	$945,490,762		$945,490,762	$1,181,863,453	$802,711,844	$379,151,609
2037	$915,191,559	$50,000,000	$965,191,559		$965,191,559	$1,206,489,449	$819,437,616	$387,051,833
2038	$935,325,773	$50,000,000	$985,325,773		$985,325,773	$1,231,657,217	$836,531,355	$395,125,862
2039	$955,902,941	$50,000,000	$1,005,902,941		$1,005,902,941	$1,257,378,676	$854,001,156	$403,377,519
2040	$976,932,805	$50,000,000	$1,026,932,805		$1,026,932,805	$1,283,666,006	$871,855,293	$411,810,713
							$21,066,582,819	

Assumptions used in compiling this data were as follows:

1. Federal funding and state match for the period of 2020 – 2024 reflect current TIP allocations;
2. Beginning in 2025 a 2.2% growth rate (average of last 4 yrs. Of FAST Act) is applied to the federal funding amounts;
3. August redistribution of Federal Funds is assumed to be $50million per year through to 2040;

4. GANs (Grant Anticipation Notes) repayment is provided until 2026; the remainder is split between 2027 & 2028
5. Funding available for MPO Target Programming is approximately one-third (1/3) of the total Federal Aid and Non-Federal Aid funding.

The available statewide figures for each program were then allocated to the various MPO's in the Commonwealth based upon the following assumptions:

1. Interstate Maintenance distribution was based on the percent of Interstate lanes miles per MPO region;
2. NHS distribution was based on the percentage of NHS lane miles per MPO region;
3. Statewide Bridge funds were allocated to each MPO based upon the percentage of bridges contained within each jurisdiction;
4. Federal Aid funding targets were distributed to each MPO based upon the existing Massachusetts Association of Regional Planning Agencies (MARPA) (a working group comprised of the 13 MA RPA's) TIP target percentages.

The resulting fund estimates for the Montachusett MPO based upon the above assumptions and allocations are as follows:

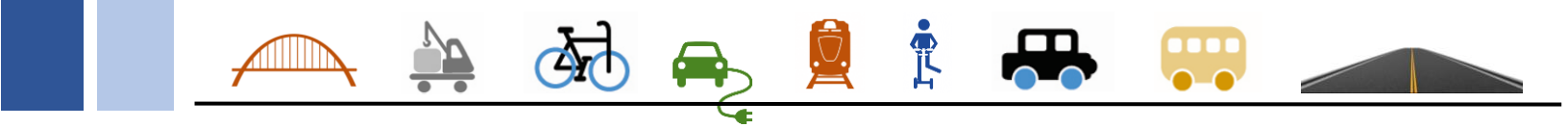


Table 10-2. Montachusett MPO Funding Allocations 2020 to 2040

	Funding available for MPOs	Montachusett MPO Targets	Bridges	IM	NHS	Remain SW	NFA Preservation
	MARPA formula ▶	*4.4596%*	*8.2093%*	*1.9892%*	*6.2274%*	*4.4596%*	*4.4596%*
2020	$238,504,940	$10,636,366	$16,230,536	$830,730	$5,074,220	$8,205,272	$4,459,600
2021	$243,332,404	$10,851,652	$14,761,077	$546,912	$4,206,302	$10,717,156	$4,459,600
2022	$248,287,245	$11,072,618	$16,230,536	$506,353	$3,981,181	$10,638,844	$4,459,600
2023	$253,710,045	$11,314,453	$17,035,476	$546,176	$4,391,467	$10,330,468	$4,459,600
2024	$257,035,355	$11,462,749	$16,623,166	$718,284	$4,836,874	$10,163,596	$4,459,600
	1st five years ▶	$55,337,838	$80,880,790	$3,148,455	$22,490,044	$50,055,336	$22,298,000
2025	$261,140,921	$11,645,841	$16,888,684	$729,757	$4,914,132	$10,325,937	$4,557,711
2026	$265,280,095	$11,830,431	$17,156,375	$741,324	$4,992,023	$10,489,607	$4,557,711
2027	$280,671,131	$12,516,810	$18,151,755	$784,334	$5,281,651	$11,098,193	$4,557,711
2028	$287,166,164	$12,806,462	$18,571,806	$802,485	$5,403,874	$11,355,017	$4,557,711
2029	$328,412,234	$14,645,872	$21,239,300	$917,747	$6,180,040	$12,985,954	$4,557,711
	2nd five years ▶	$63,445,416	$92,007,920	$3,975,647	$26,771,720	$56,254,708	$22,788,556
2030	$335,196,192	$14,948,409	$21,678,037	$936,704	$6,307,700	$13,254,203	$4,657,981
2031	$342,129,397	$15,257,603	$22,126,426	$956,079	$6,438,168	$13,528,353	$4,657,981
2032	$349,215,132	$15,573,598	$22,584,679	$975,880	$6,571,507	$13,808,535	$4,657,981
2033	$356,456,753	$15,896,545	$23,053,014	$996,117	$6,707,779	$14,094,880	$4,657,981
2034	$363,857,691	$16,226,598	$23,531,653	$1,016,799	$6,847,050	$14,387,525	$4,657,981
	3rd five years ▶	$77,902,753	$112,973,809	$4,881,580	$32,872,204	$69,073,496	$23,289,904
2035	$371,421,448	$16,563,911	$24,020,821	$1,037,936	$6,989,384	$14,686,608	$4,760,456
2036	$379,151,609	$16,908,645	$24,520,752	$1,059,538	$7,134,850	$14,992,272	$4,760,456
2037	$387,051,833	$17,260,964	$25,031,680	$1,081,615	$7,283,516	$15,304,659	$4,760,456
2038	$395,125,862	$17,621,033	$25,553,849	$1,104,178	$7,435,452	$15,623,920	$4,760,456
2039	$403,377,519	$17,989,024	$26,087,506	$1,127,237	$7,590,731	$15,950,204	$4,760,456
	4th five years ▶	**$86,343,576**	**$125,214,609**	**$5,410,503**	**$36,433,933**	**$76,557,662**	**$23,802,282**
2040	$411,810,713	$18,365,111	$26,632,903	$1,150,803	$7,749,427	$16,283,666	$4,865,186
	5th five years ▶	$18,365,111	$26,632,903	$1,150,803	$7,749,427	$16,283,666	$4,865,186
	Total ▶	**$301,394,694**	**$437,710,032**	**$18,566,989**	**$126,317,328**	**$268,224,869**	**$97,043,929**

Funding estimates under the above category labelled "Montachusett MPO Targets" represent the funds that are utilized in the development of the annual Transportation Improvement Program (TIP). By providing these "Target" funding levels, the MPO's are able to develop fiscally constrained TIP's for each Federal Fiscal Year (FFY). These funds are also considered discretionary in that the MPO has direct input into the types of projects that are prioritized and funded. In addition to typical road projects, bicycle and pedestrian projects, site specific intersection

projects, congestion relief projects, safety improvement projects, and projects with air quality benefits are funded through these targets.

In order to establish funding levels for the categories under the Montachusett MPO Targets, information from the FFY 2020-2024 TIP and the future planning scenarios were examined.

The first five-year block of the funding targets, i.e. FFY 2020 to 2024, coincide with the endorsed FFY 2020-2024 TIP and therefore are consistent across both planning scenarios. For the time frame covering FFY 2025 to 2040, the financial analysis was based upon the future planning scenarios discussed in the RTP Scenarios chapter.

Regional Highway Needs

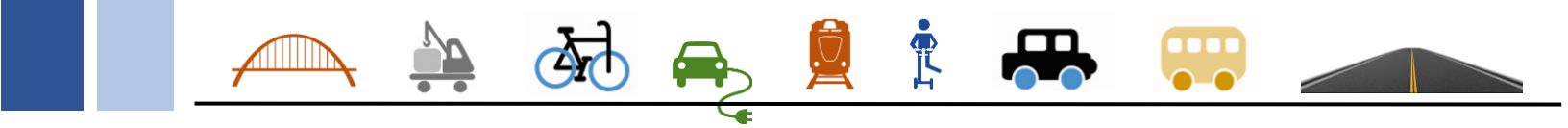
Bridge Needs

As illustrated in the Infrastructure chapter of this RTP, the number of Structurally Deficient (SD) bridges in the Montachusett Region has trended upward from 2018. Overall, there has been a significant reduction in SD bridges from 2006, a decrease of some 17 bridges. This is due to the emphasis placed on bridges through the Accelerated Bridge program by MassDOT. In order to prevent any "backsliding" within the region, it is important to maintain an emphasis on SD bridges by the Commonwealth as bridge priorities fall under the purview and discretion of MassDOT's Bridge Section. Within the Montachusett Region, some 35 bridges are currently identified as SD.

As indicated in the Infrastructure section, if bridge funding does not remain a priority, more bridges can slip into SD conditions and the positive trend started in 2006 will be reversed and the trend over the last year will continue and likely grow exponentially.

Pavement Needs

The region contains a mix of state and local jurisdiction federal aid eligible roads. In addition, those roads classified as NHS are eligible for Interstate Maintenance (IM) and NHS funding. Those roads are under the purview of MassDOT and are assumed to be funded from statewide NHS/IM allocations. These are approximately 157 miles (or 23%) of the total regional federal aid roads in this category. That leaves approximately 77%, or 523 miles, of roads that are eligible to be funded with regional discretionary, or target, funding.



An analysis conducted in the prior RTP established a regional yearly pavement improvement need of $139,667,895 in order to bring all roads up to good to excellent condition. This figure was expressed in 2016 dollars and is the starting point for the analysis of pavement maintenance needs for the 2020 RTP.

Outlined under the Pavement section of this RTP, a slight change was noted between the percentages of road miles classified as Excellent, Good, Fair and Poor. Those changes are listed below.

Table 10-3: Pavement Condition Change

		State		Local		Combined	
		%	% Points Change	%	% Points Change	%	% Points Change
2019	Excellent	31%	-16%	22%	9%	24%	-1%
	Good	36%	10%	18%	-3%	23%	1%
	Fair	21%	7%	25%	-14%	24%	-6%
	Poor	12%	0%	35%	8%	29%	6%

These percent changes were applied to the cost calculations in 2016 to establish a new yearly pavement estimate. This figure is $143,028,574 in 2016 dollars. Adjusting at 4% per year for inflation, the new 2019 starting figure is now $160,192,000.

If MPO Federal Aid Target funds are applied and allocated to maintenance projects based on prior patterns identified from 2010 to 2020 projects (as shown below under Scenario 1 – Status Quo), 66% of target funds would be allocated to pavement projects.

Table 10-4: Scenario 1 Pavement Backlog

Regional Funds	2020-2024	2025-2029	2030-2034	2035-2040
MPO Target Funds	$36,105,876	$29,372,872	$49,329,750	$69,107,734
Est. Pavement Needs	($469,908,739)	($760,960,547)	($728,102,038)	($690,451,425)
Balance	($433,802,864)	($731,587,675)	($678,772,288)	($621,343,691)

Utilizing an unrealistic assumption that pavement deterioration will not occur between 2020 and 2040, spending at a rate of 66% of target funds on maintenance would not see a switch over to 100% excellent roads during the life of this RTP. To accelerate this process and see a switch over

during this RTP cycle, spending 95% of target funds on maintenance will cause a switch over in 2038.

It must be noted that pavement conditions as well as repair costs are continually changing variables based on many different factors. As one road is repaired, additional sections can be overlooked and quickly fall into disrepair requiring more extensive rehabilitation needs and costs. These allocations can quickly be overrun resulting in maintenance needs surpassing available funds. A robust pavement management program is one way to better project road needs and stretch maintenance dollars by utilizing more routine and preventative maintenance. Therefore, this analysis should be viewed as illustrative of the continuing infrastructure problem.

Major Infrastructure Projects

Through the development of this RTP, several projects or needs were identified. Some of these are relatively large in terms of scope, design or possibly cost. These have been identified as "Major Infrastructure" projects. They will likely entail several years of study, public outreach and design before implementation. However, for the Montachusett region only one of these projects is assumed to occur during the life of the RTP, the Route 2 Interchange at South Athol Road.

Table 10-5: Major Infrastructure Projects Included in Fiscal Analysis

Major Infrastructure Project	2020-2024	2025-2029	2030-2034	2035-2039	2040	
Route 2 at South Athol Road - New Interchange & Bridge		$14,233,118	$14,233,118			$28,466,236

- Route 2 at South Athol Road: The town of Athol has presented a project to construct a new interchange with Route 2 at South Athol Road. This new interchange would help the town improve access to Route 2 for commercial and passenger vehicles, thus relieving congestion on smaller local roads, extending the pavement life of those roads, expanding the town's economic base and provide quicker emergency response times. Estimated cost in 2020 dollars - $20,000,000. Programmed for 2029 and 2030 with YOE costs factored in.

Other major projects identified during the RTP process are summarized below but, as mentioned, are not incorporated into the financial plan of the RTP as these are still concepts with little analysis and subsequently, no cost estimates.

Table 10-6: Major Infrastructure Projects

Community	Location	Potential Impact/Benefit
Athol, Phillipston	Route 2 Lane Addition	Capacity
Fitchburg	Route 31 RR Bridge	Access
Fitchburg	Wachusett Station Improvements	Complete Streets, Access
Fitchburg	John Fitch Highway Stormwater and Complete Streets upgrades.	Complete Streets, Stormwater, GHG
Fitchburg	Route 2 at Mt. Elam Rd.	Safety, GHG
Lancaster	Route 117 at Bolton Flats	Drainage Upgrades
Leominster	Route 190 at Route 2	Capacity, Safety
Leominster	Route 13 Interchange on Route 2	Safety, GHG
Leominster/ Fitchburg	Merriam Ave./ South St. Corridor	Capacity, GHG
Sterling	Route 62 at Route 140	Safety
Westminster	Route 140 at Mile Hill Rd.	Stormwater Upgrades

Non-Funded Major Infrastructure Projects

- Route 2 Lane Addition from Phillipston to Athol: The town of Athol has raised the question of a possible expansion of Route 2 from its current two-lane configuration to four lanes. The project limits start from the Phillipston town line to approximately Route 202 near the Athol/Orange town line.
- Route 2 at Mt. Elam Road: For a number of years, the state has tried to address a safety, access and environmental issue along Route 2 in the vicinity of Mt Elam Road. Bordering the Notown Reservoir, the state must address an environmental issue related to runoff into the city of Leominster's drinking supply. Additionally, a traffic signal currently exists at the Route 2/Mt Elam Road intersection that is the site of many vehicular crashes.
- Wachusett Station Improvements: Wachusett Station is a new commuter rail parking lot and train station on the Fitchburg Commuter Rail Line. Built to house over 400 vehicles, this station is the start and end point for this line into Boston. The need for a solution to the current railroad underpass on Route 31 located just north of the station which constricts all modes of traffic in that area, and bicycle and pedestrian accommodations should be considered.

Remaining Regional Needs

Table 10-7 below is derived from crash analysis in the Safety section of this RTP. Locations and corridors with a high number of fatal crashes are listed along with possible costs associated with increasing safety.

Table 10-7: Fatal Crash Corridors

All Crashes with Fatal Crash Corridor Names by MassDOT Urban / Rural Areas					
ID	**Communities**	**Fatal Crash Corridors***	**Urban Crashes**	**Rural Crashes**	Cost Estimate
8	Athol	Pequoig & Pinedale Avenue, Athol	14		$500,000
25	Athol	Route 2 near Orange TL, Athol	11		$500,000
26	Athol	Route 2 near Phillipston TL, Athol	9		$500,000
28	Ayer	Route 2A & Washington Street, Ayer	77		$500,000
13	Ashburnham	Route 119 Rindge State Road, Ashburnham		2	$250,000
16	Ashburnham	Route 12 Winchendon Road, Ashburnham	8		$500,000
39	Ashburnham	Sherbert Road, Ashburnham		3	$250,000
10	Ashby	Rindge Road, Ashby	7	7	$250,000
38	Athol & Phillipston	Rt 2A State/Templeton Rd, Athol/Phillipston	6	6	$250,000
33	Clinton	Route 62 Boylston Mechanic Street, Clinton	13		$500,000
35	Clinton	Routes 62/70/110 Main Street, Clinton	49		$500,000
1	Fitchburg	Airport Road Crawford Street, Fitchburg	55		$500,000
2	Fitchburg	Boulder Drive, Fitchburg	30		$500,000
3	Fitchburg	Canton Salem Street, Fitchburg	22		$500,000
31	Fitchburg & Ashby	Route 31, Fitchburg/Ashby (south)	107	7	$500,000
4	Gardner	Green & Elm St, Gardner	94		$500,000
5	Gardner	Howard St, Gardner	12		$500,000
20	Gardner	Route 2 American Legion Circle, Gardner	66		$500,000
34	Gardner	Route 68 West Street, Gardner	38		$500,000
7	Groton	Longley Street, Groton	8		$500,000
12	Harvard	Route 110 Ayer Road, Harvard	34	10	$500,000
11	Leominster	River Street, Leominster	2		$500,000
14	Leominster	Route 12 Central Street, Leominster	189		$500,000
40	Leominster	Union Street Washington Street, Leominster	25		$500,000
42	Leominster	Washington Street, Leominster	22		$500,000
9	Lunenburg	Pleasant Street, Lunenburg	1		$500,000
37	Lunenburg & Leominster	Rt 13 Electric Ave Main St, Lunenburg/Leominster	158		$500,000
32	Royalston	Route 32 Athol Richmond Road, Royalston		1	$250,000
19	Sterling	Route 140 Redemption Rock Trail, Sterling		13	$250,000
6	Sterling & Lancaster	I 190 Southbound, Sterling/Lancaster	9		$500,000
21	Templeton	Route 2 Exists 20 & 21, Templeton	23		$500,000
41	Townsend	Wallace Hill Road, Townsend		6	$250,000
24	Westminster	Route 2 Exits 25 & 26, Westminster	46		$500,000
29	Westminster	Route 2A State Road West, Westminster	12		$500,000
36	Westminster & Ashburnham	Rt 12 Ashburnham State Rd, Westminster/Ashburnham	1	14	$250,000
17	Westminster & Gardner	Route 140 at Rt 2 Exit 24, Westminster/Gardner	19		$500,000
18	Winchendon	Route 140 Gardner Road, Winchendon		32	$500,000
27	Winchendon	Route 202 Baldwinville State Road, Winchendon	14		$500,000
			1,181	101	
			92%	8%	
			1,282		

*Corridors listed alphabetically

Table 10-8 below is derived from crash analysis in the Safety section of this RTP. High crash locations are listed along with possible costs associated with increasing safety.

Table 10-8: High Crash Locations

RANK (2015)	ID	MUNICIPALITIES	High Crash Locations for Safety Projects for 2020 RTP	BIKE HCL	PED HCL	Top200 2016	Top200 2015	Safety Project Location in 2016 RTP Safety Project List	Estimated Cost
97	18	ASHBY	GREENVILLE ROAD (SR31 NB) at TURNPIKE ROAD						
67	33	FITCHBURG	AIRPORT ROAD at BENSON STREET						$ 1,000,000
27	90	FITCHBURG	BEMIS ROAD at AIRPORT ROAD					•	$ 1,000,000
90	14	FITCHBURG	BEMIS ROAD at ROBERT STREET						$ 1,000,000
12	65	FITCHBURG	BOULDER DRIVE at MAIN STREET (SR2A EB)		•	•			$ 1,000,000
67	81	FITCHBURG	BOULDER DRIVE at PUTNAM STREET						$ 1,000,000
81	21	FITCHBURG	CLARENDON STREET at DANIELS STREET						$ 1,000,000
55	79	FITCHBURG	ELECTRIC AVENUE at ROLLSTONE ROAD					•	$ 1,000,000
34	88	FITCHBURG	FRANKLIN ROAD at OAK HILL ROAD			•			$ 1,000,000
17	6	FITCHBURG	***JOHN FITCH HIGHWAY***						$ 1,000,000
81	73	FITCHBURG	***JOHN FITCH HIGHWAY at BEMIS ROAD***						$ 1,000,000
90	56	FITCHBURG	***JOHN FITCH HIGHWAY at NORTH STREET***					•	$ 1,250,000
18	46	FITCHBURG	***JOHN FITCH HIGHWAY at SUMMER STREET***					•	$ 1,000,000
81	2	FITCHBURG	LAUREL STREET (SR2A EB) at SOUTH STREET						$ 1,000,000
90	49	FITCHBURG	LAUREL STREET at PUTNAM STREET						$ 1,000,000
40	62	FITCHBURG	LUNENBURG STREET (SR2A EB) at JOHN FITCH HIGHWAY						$ 1,000,000
103	51	FITCHBURG	LUNENBURG STREET (SR2A EB) at TOWNSEND STREET						$ 1,000,000
23	27	FITCHBURG	**MAIN STREET (SR2A EB)**		•			•	$ 1,000,000
67	72	FITCHBURG	**MAIN STREET at CUSHING STREET**		•				$ 1,000,000
35	45	FITCHBURG	**MAIN STREET at MILL STREET**		•				$ 1,000,000
60	64	FITCHBURG	**MAIN STREET at RIVER STREET (SR31 NB)**						$ 1,000,000
67	39	FITCHBURG	**MAIN STREET at WATER STREET**		•			•	$ 1,000,000
97	55	FITCHBURG	PEARL STREET at COOLIDGE AVENUE						$ 1,000,000
30	67	FITCHBURG	ROUTE 2 (SR2 EB) at MOUNT ELAM ROAD					•	$ 1,250,000
65	25	FITCHBURG	ROUTE 2 (SR2 EB) at RAMP-RT 2 EB TO RT 31						$ 1,000,000
51	69	FITCHBURG	**SOUTH STREET at ELECTRIC AVENUE**						$ 1,000,000
97	34	FITCHBURG	**SOUTH STREET at ROCKDALE AVENUE**						$ 1,000,000
8	20	FITCHBURG	**SOUTH STREET at WANOOSNOC ROAD**				•	•	$ 1,000,000
103	86	FITCHBURG	WALLACE AVENUE at ELM STREET						$ 750,000
10	9	FITCHBURG	**WATER STREET (SR12 NB)**					•	$ 1,000,000
39	32	FITCHBURG	**WATER STREET (SR12 NB)**					•	$ 1,000,000
97	53	FITCHBURG	**WATER STREET (SR12 NB)**					•	$ 1,000,000
74	61	FITCHBURG	**WATER STREET (SR12 NB) at ABBOTT AVENUE**					•	$ 750,000
60	83	FITCHBURG	**WATER STREET (SR12 NB) at BENSON STREET**					•	$ 750,000
13	23	FITCHBURG	**WATER STREET (SR12 NB) at BIRCH STREET**						$ 1,000,000
67	93	FITCHBURG	**WATER STREET (SR12 NB) at JOHN T CENTRINO MEMORIAL DRIVE**						$ 1,000,000
3	42	FITCHBURG	**WATER STREET (SR12 NB) at WANOOSNOC ROAD**			•	•	•	$ 750,000
57	80	FITCHBURG	WESTMINSTER STREET (SR2A EB) at ASHBURNHAM STREET (SR12 NB)					•	$ 1,000,000
48	8	FITCHBURG	WESTMINSTER STREET (SR2A EB) at PRINCETON ROAD					•	$ 1,000,000
7	71	FITCHBURG	WHALON STREET at PIERCE AVENUE				•	•	$ 1,000,000
21	68	GARDNER	AMERICAN LEGION CIRCLE (SR68 NB) at DOUGLAS ROAD					•	$ 1,000,000
55	85	GARDNER	CENTRAL STREET (SR101 NB) at MAIN STREET (SR68 NB)						$ 1,000,000
59	78	GARDNER	ELM STREET at PEARL STREET (SR101 NB)					•	$ 1,000,000
48	13	GARDNER	GREEN STREET					•	$ 1,000,000
24	58	GARDNER	MAIN STREET (SR68 NB) at TIMPANY BOULEVARD (SR68 SB) (1 of 2)		•			•	$ 1,000,000
26	76	GARDNER	MAIN STREET (SR68 NB) at WILLOW STREET		•			•	$ 1,000,000
48	95	GARDNER	PARKER STREET (SR101 NB) at OAK STREET						$ 1,000,000
8	29	GARDNER	PEARSON BOULEVARD at UNION SQUARE				•	•	$ 1,000,000
81	3	GARDNER	ROUTE 2 at RAMP-RT 2 WB TO RT 68					•	$ 1,250,000
16	89	GARDNER	TIMPANY BOULEVARD (SR68 NB) NORTH OF UNION STREET						$ 1,000,000
43	10	GARDNER	TIMPANY BOULEVARD (SR68 NB) at WEST BROADWAY (SR2A EB)					•	$ 1,000,000
40	57	GARDNER	MAIN STREET (SR68 NB) at TIMPANY BOULEVARD (SR68 SB) (2 of 2)		•				$ 1,000,000
30	101	GROTON	MAIN STREET (SR119 EB) at LOWELL ROAD (SR40 EB)						$ 1,000,000

Table 10-8: High Crash Locations (continued)

5	105	HARVARD	AYER ROAD (SR110 EB) at ROUTE 2 (SR2 EB)					•	$ 1,250,000
65	82	LANCASTER	INTERSTATE 190 (I190 NB) at RAMP-RT 190 NB FROM RT 117						$ 1,000,000
51	48	LANCASTER	LOWER BOLTON ROAD (SR110 EB) at HIGH STREET EXTENSION (SR110 EB)						$ 1,000,000
74	52	LANCASTER	MAIN STREET (SR117 EB) at LUNENBURG ROAD (SR70 NB)					•	$ 1,250,000
81	16	LANCASTER	ROUTE 2 (SR2 EB)						$ 1,250,000
6	28	LANCASTER	ROUTE 2 (SR2 EB) at JACKSON ROAD					•	$ 1,250,000
74	50	LANCASTER	ROUTE 2 (SR2 EB) at RAMP-RT 2 EB TO OLD TURNPIKE RD (RT 70)					•	$ 1,250,000
60	75	LANCASTER	ROUTE 2 (SR2 WB) at RAMP-RT 2 WB TO FORT POND RD (SHIRLEY RD)						$ 1,250,000
30	44	LEOMINSTER	CENTRAL STREET (SR12 NB) at LITCHFIELD STREET						$ 1,250,000
25	17	LEOMINSTER	COMMERCIAL ROAD						$ 1,000,000
90	60	LEOMINSTER	LANCASTER STREET (SR117 EB) at VISCOLOID AVENUE						$ 1,000,000
20	70	LEOMINSTER	MAIN STREET (SR12 NB) at MONUMENT SQUARE (SR12 NB)		•			•	$ 1,000,000
22	5	LEOMINSTER	**MAIN STREET (SR13 NB) at MEAD STREET**						$ 1,000,000
2	100	LEOMINSTER	**MAIN STREET (SR13 NB) at NASHUA STREET**	•			•		$ 1,000,000
29	104	LEOMINSTER	**MAIN STREET (SR13 NB) at NORTH STREET**						$ 1,000,000
60	92	LEOMINSTER	**MAIN STREET (SR13 NB) at PROSPECT STREET**	•					$ 1,000,000
40	59	LEOMINSTER	**MAIN STREET (SR13 NB) at RIVER STREET**	•					$ 1,000,000
97	87	LEOMINSTER	MECHANIC STREET at FIFTH STREET						$ 1,000,000
43	22	LEOMINSTER	MECHANIC STREET at LEOMINSTER CONNECTOR						$ 1,000,000
51	98	LEOMINSTER	MECHANIC STREET at WATER STREET		•				$ 1,000,000
35	47	LEOMINSTER	MERRIAM AVENUE at LINDELL AVENUE						$ 1,000,000
60	37	LEOMINSTER	MILL STREET at HAWS STREET					•	$ 1,000,000
4	66	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) AT FRUIT STREET/NELSON STREET**				•	•	$ 1,000,000
38	24	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) AT HOLMAN AVENUE**					•	$ 1,000,000
57	12	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) AT WESTLAND AVENUE**					•	$ 1,000,000
81	36	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) AT ERDMAN WAY (1 OF 2)**					•	$ 750,000
90	91	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) at STATE STREET (2 of 2)**						$ 750,000
90	30	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) at STATE STREET (1 of 2)**					•	$ 750,000
103	41	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) MIDBLOCK ERDMAN WAY/MOORE STREET**					•	$ 1,000,000
11	63	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) at HAMILTON STREET**			•		•	$ 1,000,000
51	40	LEOMINSTER	**NORTH MAIN STREET (SR12 NB) at WASHINGTON STREET**						$ 1,250,000
43	19	LEOMINSTER	**ROUTE 2 (SR2 EB) at MAIN STREET (SR13 NB)**						$ 1,250,000
15	103	LEOMINSTER	**ROUTE 2 (SR2 EB) at MEAD STREET**					•	$ 1,250,000
81	31	LEOMINSTER	**ROUTE 2 (SR2 EB) at MEAD STREET**						$ 1,250,000
19	26	LEOMINSTER	**ROUTE 2 (SR2 EB) at MERRIAM AVENUE**					•	$ 1,250,000
67	35	LEOMINSTER	**ROUTE 2 (SR2 EB) at MERRIAM AVENUE**						$ 1,250,000
1	43	LEOMINSTER	**ROUTE 2 (SR2 EB) at RAMP-RT 12 NB TO RT 2 WB**						$ 1,250,000
74	77	LEOMINSTER	**ROUTE 2 (SR2 EB) at RAMP-RT 12 NB TO RT 2 WB**						$ 1,250,000
43	74	LEOMINSTER	**ROUTE 2 (SR2 EB) at RAMP-RT 2 EB TO HAWS ST**					•	$ 1,250,000
81	11	LEOMINSTER	SACK BOULEVARD at CINEMA BOULEVARD						$ 1,000,000
90	97	LEOMINSTER	WASHINGTON STREET at MERRIAM AVENUE						$ 1,000,000
28	1	LEOMINSTER	WEST STREET at PARK STREET		•			•	$ 1,000,000
74	54	LEOMINSTER	WHITNEY STREET at SPRUCE STREET						$ 1,000,000
67	102	LEOMINSTER (75%) / FITCHBURG (25%)	NORTH MAIN STREET (SR12 NB) AT ERDMAN WAY (2 OF 2)					•	$ 750,000
81	96	LUNENBURG	MASSACHUSETTS AVENUE (SR2A EB) at ELECTRIC AVENUE (SR13 NB)					•	$ 1,000,000
30	94	SHIRLEY	TOWNSEND ROAD at GROTON ROAD (SR225 EB)					•	$ 1,000,000
35	99	STERLING	INTERSTATE 190 (I190 NB)					•	$ 1,250,000
43	7	STERLING	INTERSTATE 190 (I190 SB) at RAMP-RT 190 SB TO RT 12					•	$ 1,250,000
14	**84**	**STERLING**	**LEOMINSTER ROAD (SR12 NB) at CHOCKSETT ROAD**					•	$ 1,000,000
97	38	STERLING	REDEMPTION ROCK TRAIL (SR140 NB) at PRINCETON ROAD						$ 1,000,000
74	15	TOWNSEND	MAIN STREET (SR119 EB)						$ 1,000,000
74	4	WINCHENDON	SPRING STREET (SR12 NB) at CENTRAL STREET						$ 1,000,000

The remaining project needs identified in this RTP include various safety improvements at intersections or along corridors, congestion improvements, pedestrian/bicycle improvements, etc. The funding for these improvements is assumed to be derived from the statewide funding

allocated to the Montachusett region as well as through the discretionary MPO Funding ("Target") amounts.

Projects include, but are not limited to, those listed in the various parts of this RTP. These projects are assumed to be implemented during the timeframe of this RTP. Most are in need of further study in order to determine potential solutions for the location.

For planning purposes, it is assumed that funding will be derived from the estimated allocations to the region from various statewide categories (i.e. Interstate Maintenance, NHS, Infrastructure, Remaining Statewide Programs and Non-Federal Aid Preservation) as well as through identified funding categories, programs or bands, i.e. Safety, Pedestrian & Pedestrian Facilities, Complete Streets etc.

Non-Funded Major Infrastructure Projects

Table 10-9: Highway Funding vs. Needs

Highway Available Funding vs. Needs Funding

AVAILABLE FUNDING	2020-2024	2025-2029	2030-2034	2035-2039	2040	2020-2040
Statewide Programs	$178,872,625	$201,798,551	$243,090,993	$267,418,989	$56,681,985	$947,863,143
Bridges	$80,880,790	$92,007,920	$112,973,809	$125,214,609	$26,632,903	$437,710,031
Interstate Maintenance	$3,148,455	$3,975,647	$4,881,580	$5,410,503	$1,150,803	$18,566,988
National Highway System	$22,490,044	$26,771,720	$32,872,204	$36,433,933	$7,749,427	$126,317,328
Remaining Statewide Programs	$50,055,336	$56,254,708	$69,073,496	$76,557,662	$16,283,666	$268,224,868
Non-Federal Aid Preservation	$22,298,000	$22,788,556	$23,289,904	$23,802,282	$4,865,186	$97,043,928
MPO Funding (Discretionary Funding)	$55,337,838	$63,445,416	$77,902,753	$86,343,577	$18,365,111	$301,394,695
Road Maintenance & Infrastructure	$55,337,838	$41,873,975	$51,415,817	$56,986,761	$12,120,973	$217,735,364
Safety	-	$8,247,904	$10,127,358	$11,224,665	$2,387,464	$31,987,391
Pedestrian & Bicycle Facilities	-	$6,978,996	$8,569,303	$9,497,793	$2,020,162	$27,066,254
Complete Streets	-	$3,806,725	$4,674,165	$5,180,615	$1,101,907	$14,763,411
Climate Change & Environment	-	$1,268,908	$1,558,055	$1,726,872	$367,302	$4,921,137
Congestion Relief	-	$1,268,908	$1,558,055	$1,726,872	$367,302	$4,921,137
Transit Options	-					
Regional Access	-					
Community Access	-					
Other	-					
TOTAL AVAILABLE FUNDING	**$234,210,463**	**$265,243,967**	**$320,993,746**	**$353,762,566**	**$75,047,096**	**$1,249,257,838**

Table 10-9: Highway Funding vs. Needs (continued)

ESTIMATED FUNDING NEEDS	2020-2024	2025-2029	2030-2034	2035-2039	2040	2020-2040
Statewide Programs	$42,643,034	$99,815,706	$122,370,981	$86,015,443	$55,593,025	$406,438,189
Bridges	$17,612,774	$6,624,972	$8,278,593	$9,374,068	$10,098,533	$51,988,940
Interstate Maintenance	$1,879,150	$9,562,712	$2,671,011	$3,000,000	$3,500,000	$20,612,873
National Highway System	$19,863,110	$57,331,126	$56,992,493	$42,554,454	$20,000,000	$196,741,183
Remaining Statewide Programs	$1,248,000	$0	$2,106,617	$2,385,377	$2,569,729	$8,309,723
Non-Federal Aid Preservation	$2,040,000	$26,296,896	$52,322,267	$28,701,544	$19,424,763	$128,785,470
MPO Funding (Discretionary Funding)	$52,634,604	$63,445,416	$77,902,753	$86,343,577	$18,365,111	$298,691,461
Road Maintenance & Infrastructure	$45,180,825	$32,140,857	$41,682,699	$56,986,761	$12,120,973	$188,112,115
Safety	$2,653,189	$5,747,904	$7,627,358	$11,224,665	$2,387,464	$29,640,580
Pedestrian & Bicycle Facilities	$1,165,335	$6,978,996	$8,569,303	$9,497,793	$2,020,162	$28,231,589
Complete Streets	$0	$3,806,725	$4,674,165	$5,180,615	$1,101,907	$14,763,411
Climate Change & Environment	$3,635,255	$268,908	$558,055	$1,726,872	$367,302	$6,556,392
Congestion Relief	$0	$268,908	$558,055	$1,726,872	$367,302	$2,921,137
Transit Options	$0	$0	$0	$0	$0	$0
Regional Access	$0	$0	$0	$0	$0	$0
Community Access	$0	$0	$0	$0	$0	$0
Other	$0	$0	$0	$0	$0	$0
Major Infrastructure Project - *Rt 2 at South Athol Rd Interchange & Bridge*		$14,233,118	$14,233,118			$28,466,236
MPO Estimated Needs	$52,634,604	$63,445,416	$77,902,753	$86,343,577	$18,365,111	$298,691,461
TOTAL ESTIMATED NEEDS	**$95,277,638**	**$177,494,240**	**$214,506,852**	**$172,359,020**	**$73,958,136**	**$733,595,886**

Table 10-10: Fiscal Constraint

AVAILABLE LESS MPO NEEDS	2020-2024	2025-2029	2030-2034	2035-2039	2040	2020-2040
TOTAL AVAILABLE MPO FUNDING (Discretionary Funding)	$52,634,604	$63,445,416	$77,902,753	$86,343,577	$18,365,111	$298,691,461
Major Infrastructure Projects		$14,233,118	$14,233,118			$28,466,236
TOTAL MPO ESTIMATED NEEDS	**$52,634,604**	**$63,445,416**	**$77,902,753**	**$86,343,577**	**$18,365,111**	**$298,691,461**
Available Funding Less Estimated Needs	***$0***	***$0***	***$0***	***$0***	***$0***	***$0***

Table 10-10 above shows the total available MPO funding vs. estimated MPO needs. The bottom row of this table shows any left-over monies in funding vs. needs for the 20-year time period of the RTP. If any unspent MPO Discretionary funds are identified, they should not be considered "surplus" funds due to unidentified needs and additional unforeseen costs which could arise

during this time period. The main purpose of this table is to demonstrate fiscal constraint. The fiscal constraint demonstrated by Table 10-10 should allow for implementation of additional TIP funded projects beyond the identified needs as they stand. It should also be noted that this fiscal constraint analysis applies to all three funding scenarios included in this RTP.

Expected Funding - Transit

Expected Transit Funding

MassDOT Transit also developed and provided each MPO and Regional Transit Authority with funding estimates for transit planning purposes using the following assumption:

- Federal funding and state match for the period of 2020 – 2024 reflect current TIP allocations and funding for FFY 2025 is assumed to grow at a rate determined by funding category from FFY 2025 onward.

The following table provides estimates for the Montachusett Regional Transit Authority (MART).

Table 10-11: Estimated Transit Funding

Inflation rates based on total FAST Act (2016–2020) funding levels | = final number published in the apportionment table | = preliminary number

SECTION 5307 (inflation rate: 2.08%)

	Fast Act											
Boston UZA	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
MART	$ 131,573	$ 134,310	$ 137,103	$ 139,955	$ 142,866	$ 145,838	$ 148,871	$ 151,968	$ 155,129	$ 158,355	$ 161,649	$ 165,011
Worcester UZA	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
MART	$ 47,199	$ 48,181	$ 49,183	$ 50,206	$ 51,250	$ 52,316	$ 53,404	$ 54,515	$ 55,649	$ 56,807	$ 57,988	$ 59,194
Massachusetts	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
MART	$ 3,165,772	$ 3,231,620	$ 3,298,838	$ 3,367,454	$ 3,437,497	$ 3,508,997	$ 3,581,984	$ 3,656,489	$ 3,732,544	$ 3,810,181	$ 3,889,433	$ 3,970,333
Section 5307	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
MART	$ 3,344,544	$ 3,414,111	$ 3,485,124	$ 3,557,615	$ 3,631,613	$ 3,707,151	$ 3,784,259	$ 3,862,972	$ 3,943,322	$ 4,025,343	$ 4,109,070	$ 4,194,539
Total	$ 207,889,676	$ 212,213,781	$ 216,627,828	$ 221,133,687	$ 225,733,267	$ 230,428,519	$ 235,221,433	$ 240,114,038	$ 245,108,410	$ 250,206,665	$ 255,410,964	$ 260,723,512

SECTION 5307 (inflation rate: 2.08%)

Boston UZA	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
MART	$ 168,444	$ 171,947	$ 175,524	$ 179,175	$ 182,902	$ 186,706	$ 190,589	$ 194,554	$ 198,600	$ 202,731	$ 206,948
Worcester UZA	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
MART	$ 60,426	$ 61,682	$ 62,965	$ 64,275	$ 65,612	$ 66,977	$ 68,370	$ 69,792	$ 71,244	$ 72,725	$ 74,238
Massachusetts	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
MART	$ 4,052,916	$ 4,137,216	$ 4,223,270	$ 4,311,114	$ 4,400,786	$ 4,492,322	$ 4,585,762	$ 4,681,146	$ 4,778,514	$ 4,877,907	$ 4,979,368
Section 5307	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
MART	$ 4,281,785	$ 4,370,846	$ 4,461,760	$ 4,554,564	$ 4,649,299	$ 4,746,005	$ 4,844,722	$ 4,945,492	$ 5,048,358	$ 5,153,364	$ 5,260,554
Total	$ 266,146,561	$ 271,682,410	$ 277,333,404	$ 283,101,938	$ 288,990,459	$ 295,001,460	$ 301,137,491	$ 307,401,150	$ 313,795,094	$ 320,322,032	$ 326,984,731

Table 10-11: Estimated Transit Funding (continued)

SECTION 5310 (inflation rate: 2.09%)

Section 5310	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
	Fast Act											
Boston	$ 3,524,282	$ 3,597,939	$ 3,673,136	$ 3,749,905	$ 3,828,278	$ 3,908,289	$ 3,989,972	$ 4,073,363	$ 4,158,496	$ 4,245,409	$ 4,334,138	$ 4,424,721
Barnstable	$ 319,835	$ 326,520	$ 333,344	$ 340,311	$ 347,423	$ 354,684	$ 362,097	$ 369,665	$ 377,391	$ 385,279	$ 393,331	$ 401,551
Worcester	$ 413,044	$ 421,677	$ 430,490	$ 439,487	$ 448,672	$ 458,049	$ 467,623	$ 477,396	$ 487,374	$ 497,560	$ 507,959	$ 518,575
Springfield	$ 539,877	$ 551,160	$ 562,680	$ 574,440	$ 586,445	$ 598,702	$ 611,215	$ 623,989	$ 637,031	$ 650,345	$ 663,937	$ 677,813
Providence	$ 184,757	$ 188,618	$ 192,561	$ 196,585	$ 200,694	$ 204,888	$ 209,170	$ 213,542	$ 218,005	$ 222,561	$ 227,213	$ 231,962
Small Urban	$ 628,752	$ 641,893	$ 655,308	$ 669,004	$ 682,987	$ 697,261	$ 711,834	$ 726,711	$ 741,899	$ 757,405	$ 773,235	$ 789,395
Rural	$ 357,706	$ 365,182	$ 372,814	$ 380,606	$ 388,561	$ 396,682	$ 404,972	$ 413,436	$ 422,077	$ 430,899	$ 439,904	$ 449,098
Total	$ 5,968,253	$ 6,092,989	$ 6,220,333	$ 6,350,338	$ 6,483,060	$ 6,618,556	$ 6,756,884	$ 6,898,103	$ 7,042,273	$ 7,189,456	$ 7,339,716	$ 7,493,116

SECTION 5310 (inflation rate: 2.09%)

Section 5310	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
Boston	$ 4,517,198	$ 4,611,607	$ 4,707,990	$ 4,806,387	$ 4,906,840	$ 5,009,393	$ 5,114,089	$ 5,220,974	$ 5,330,092	$ 5,441,491	$ 5,555,218
Barnstable	$ 409,944	$ 418,512	$ 427,259	$ 436,188	$ 445,305	$ 454,612	$ 464,113	$ 473,813	$ 483,716	$ 493,825	$ 504,146
Worcester	$ 529,413	$ 540,478	$ 551,774	$ 563,306	$ 575,079	$ 587,098	$ 599,369	$ 611,895	$ 624,684	$ 637,740	$ 651,069
Springfield	$ 691,980	$ 706,442	$ 721,207	$ 736,280	$ 751,668	$ 767,378	$ 783,416	$ 799,790	$ 816,505	$ 833,570	$ 850,992
Providence	$ 236,810	$ 241,759	$ 246,812	$ 251,970	$ 257,236	$ 262,612	$ 268,101	$ 273,704	$ 279,425	$ 285,265	$ 291,227
Small Urban	$ 805,894	$ 822,737	$ 839,932	$ 857,487	$ 875,408	$ 893,704	$ 912,383	$ 931,452	$ 950,919	$ 970,793	$ 991,083
Rural	$ 458,485	$ 468,067	$ 477,849	$ 487,836	$ 498,032	$ 508,441	$ 519,068	$ 529,916	$ 540,991	$ 552,298	$ 563,841
Total	$ 7,649,722	$ 7,809,602	$ 7,972,822	$ 8,139,454	$ 8,309,569	$ 8,483,239	$ 8,660,538	$ 8,841,544	$ 9,026,332	$ 9,214,982	$ 9,407,575

SECTION 5311(f) (inflation rate: 2.09%)

	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
	Fast Act											
Statewide	$ 579,656	$ 591,771	$ 604,139	$ 616,765	$ 629,656	$ 642,816	$ 656,250	$ 669,966	$ 683,968	$ 698,263	$ 712,857	$ 727,756

SECTION 5311(f) (inflation rate: 2.09%)

	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
Statewide	$ 742,966	$ 758,494	$ 774,346	$ 790,530	$ 807,052	$ 823,920	$ 841,139	$ 858,719	$ 876,667	$ 894,989	$ 913,694

SECTION 5339 (inflation rate: 3.83%)

Worcester UZA	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
	Fast Act											
MART	$ 8,941	$ 9,283	$ 9,639	$ 10,008	$ 10,391	$ 10,789	$ 11,203	$ 11,632	$ 12,077	$ 12,540	$ 13,020	$ 13,519
Other Apportionments	FFY 2018 Actual	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
Small Urban	$ 698,200	$ 724,941	$ 752,706	$ 781,535	$ 811,468	$ 842,547	$ 874,817	$ 908,322	$ 943,111	$ 979,232	$ 1,016,736	$ 1,055,677
Statewide	$ 3,500,000	$ 3,634,050	$ 3,773,234	$ 3,917,749	$ 4,067,799	$ 4,223,595	$ 4,385,359	$ 4,553,318	$ 4,727,711	$ 4,908,782	$ 5,096,788	$ 5,291,995
By RTA	FFY 2018 Estimate	FFY 2019 Estimate	FFY 2020 Estimate	FFY 2021 Estimate	FFY 2022 Estimate	FFY 2023 Estimate	FFY 2024 Estimate	FFY 2025 Estimate	FFY 2026 Estimate	FFY 2027 Estimate	FFY 2028 Estimate	FFY 2029 Estimate
MART	$ 8,941	$ 9,283	$ 9,639	$ 10,008	$ 10,391	$ 10,789	$ 11,203	$ 11,632	$ 12,077	$ 12,540	$ 13,020	$ 13,519
Total	$ 9,661,981	$ 10,032,035	$ 10,416,262	$ 10,815,205	$ 11,229,427	$ 11,659,514	$ 12,106,074	$ 12,569,736	$ 13,051,157	$ 13,551,017	$ 14,070,021	$ 14,608,902

SECTION 5339 (inflation rate: 3.83%)

Worcester UZA	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
MART	$ 14,037	$ 14,574	$ 15,132	$ 15,712	$ 16,314	$ 16,938	$ 17,587	$ 18,261	$ 18,960	$ 19,686	$ 20,440
Other Apportionments	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
Small Urban	$ 1,096,110	$ 1,138,091	$ 1,181,680	$ 1,226,938	$ 1,273,930	$ 1,322,721	$ 1,373,382	$ 1,425,982	$ 1,480,597	$ 1,537,304	$ 1,596,183
Statewide	$ 5,494,679	$ 5,705,125	$ 5,923,631	$ 6,150,506	$ 6,386,070	$ 6,630,657	$ 6,884,611	$ 7,148,292	$ 7,422,071	$ 7,706,337	$ 8,001,489
By RTA	FFY 2030 Estimate	FFY 2031 Estimate	FFY 2032 Estimate	FFY 2033 Estimate	FFY 2034 Estimate	FFY 2035 Estimate	FFY 2036 Estimate	FFY 2037 Estimate	FFY 2038 Estimate	FFY 2039 Estimate	FFY 2040 Estimate
MART	$ 14,037	$ 14,574	$ 15,132	$ 15,712	$ 16,314	$ 16,938	$ 17,587	$ 18,261	$ 18,960	$ 19,686	$ 20,440
Total	$ 15,168,423	$ 15,749,374	$ 16,352,575	$ 16,978,879	$ 17,629,170	$ 18,304,367	$ 19,005,424	$ 19,733,332	$ 20,489,119	$ 21,273,852	$ 22,088,640

Capital & Operating Needs

The following table summarizes anticipated needs by the Regional Transit Authority over the life of this plan. Currently the only identified needs are within the time period of the 2020-2024 TIP. These first five years are shown along with available funding from each fund category. Years 2025-2040 in Table 10-13 show estimated funding levels which will be fully utilized by MART for capitol and operating needs.

Table 10-12: Transit Funds Programmed

Funding Category	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024	Total FFY 2020-2024
5307 Operating/Capital	$5,582,500	$5,652,500	$5,162,500	$5,472,500	$5,107,500	*$26,977,500*
5309 Operating/Capital	$0	$0	$0	$0	$0	*$0*
5310 Capital	$0	$0	$0	$0	$0	*$0*
5311 Operating	$0	$0	$0	$0	$0	*$0*
5337 Capital	$0	$0	$0	$0	$0	*$0*
5339 Capital	$0	$900,000	$0	$0	$925,000	*$1,825,000*
5320	$0	$0	$0	$0	$0	*$0*
Other Federal	$0	$0	$0	$0	$0	*$0*
Other Non-Federal	$0	$0	$0	$0	$0	*$0*
Subtotal FTA	$5,582,500	$6,552,500	$5,162,500	$5,472,500	$6,032,500	*$28,802,500*
GRAND TOTAL	$35,176,706	$38,432,031	$26,331,866	$27,167,472	$22,523,220	*$149,631,296*

Table 10-13: Anticipated Funding Programs

Available Funds	2020-2024	2025-2029	2030-2034	2035-2039	2040	Total
TOTAL 5307	$ 36,331,522.74	$ 40,270,489.39	$ 44,636,508	$ 49,475,879	$ 10,521,108	$ 181,235,507.23
TOTAL 5339	$1,825,000	$ 52,031	$ 75,769	$ 91,433	$ 20,440	$2,064,673
AVAILABLE FUNDING	**$ 38,156,522.74**	**$ 40,322,520.23**	**$ 44,712,276.90**	**$ 49,567,312.42**	**$ 10,541,547.92**	**$ 183,300,180.20**

Estimated Funding Needs	2020-2024	2025-2029	2030-2034	2035-2039	2040	Total
TOTAL 5307	$26,977,500	$ 40,270,489.39	$ 44,636,508.28	$ 49,475,879.28	$ 10,521,107.54	$171,881,484
TOTAL 5339	$1,825,000	$ 52,031	$ 75,769	$ 91,433	$ 20,440	$ 2,064,673
ESTIMATED FUNDING NEEDS	**$28,802,500**	**$40,322,520**	**$44,712,277**	**$49,567,312**	**$10,541,548**	**$173,946,157**
DIFFERENCE FUNDING MINUS NEEDS	**$ 9,354,022.74**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 9,354,022.74**

Scenario Financial Analysis

Scenario 1 - Status Quo examined past TIP funding patterns in order to establish the following breakdown for the identified funding categories:

Table 10-14. Average Percent per Funding Category – FFY 2010 to 2020

Average Percent of Total Funding Per Category FFY 2010 to FFY 2020		
Road Maintenance & Infrastructure	$107,666,164	65.83%
Safety (High Crash Locations)	$20,999,284	12.84%
Pedestrian & Bicycle Facilities	$17,392,242	10.63%
Complete Streets	$9,744,916	5.96%
Climate Change & Environment	$4,248,888	2.60%
Congestion Relief	$3,494,626	2.14%
Transit Options		
Regional Access		
Community Access		
Totals	**$163,546,120**	**100.00%**

Carrying these percentages through for 2020 to 2040, the following table illustrates the Montachusett MPO Target funds allocation for Scenario 1 – Status Quo.

Table 10-15. Financial Plan – Scenario 1 Status Quo

Funding Program	%	FFY 2020-2024 TIP					2025	2026	2027	2028	2029
		2020	2021	2022	2023	2024					
		$10,636,366	$10,851,652	$11,072,618	$11,314,453	$11,462,749	$11,645,841	$11,830,431	$12,516,810	$12,806,462	$14,645,872
		$55,337,838							$63,445,416		
Road Maintenance & Infrastructure	**66%**	$6,455,865	$8,241,745	$8,318,169	$10,820,246	$11,344,800	$7,686,255	$7,808,084	$8,261,095	$3,097,964	$4,385,552
Safety	**13%**	$1,055,190	$1,047,285	$550,714	$0	$0	$1,513,959	$1,537,956	$1,627,185	$414,840	$653,963
Pedestrian & Bicycle Facilities	**11%**	$1,055,190	$0	$110,145	$0	$0	$1,281,043	$1,301,347	$1,376,849	$1,408,711	$1,611,046
Complete Streets	**6%**	$0	$0	$0	$0	$0	$698,750	$709,826	$751,009	$768,388	$878,752
Climate Change & Environment	**2%**	$1,266,256	$1,047,285	$1,321,714	$0	$0	$232,917	$236,609	$250,336	$0	$0
Congestion Relief	**2%**	$0	$0	$0	$0	$0	$232,917	$236,609	$250,336	$0	$0
Transit Options	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Regional Access	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Community Access	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Major Infrastructure Project - Rt 2 at S. Athol Rd										$7,116,559	$7,116,559
	100%	$9,832,501	$10,336,315	$10,300,742	$10,820,246	$11,344,800	$11,645,841	$11,830,431	$12,516,810	$12,806,462	$14,645,872

Funding Program	%	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
		$14,948,409	$15,257,603	$15,573,598	$15,896,545	$16,226,598	$16,563,911	$16,908,645	$17,260,964	$17,621,033	$17,989,024	$18,365,111
				$77,902,753					$86,343,576			$18,365,111
Road Maintenance & Infrastructure	**66%**	$4,597,327	$4,813,763	$10,278,575	$10,491,720	$10,709,555	$10,932,181	$11,159,706	$11,392,236	$11,629,882	$11,872,756	$12,120,973
Safety	**13%**	$693,293	$733,488	$2,024,568	$2,066,551	$2,109,458	$2,153,308	$2,198,124	$2,243,925	$2,290,734	$2,338,573	$2,387,464
Pedestrian & Bicycle Facilities	**11%**	$1,644,325	$1,678,336	$1,713,096	$1,748,620	$1,784,926	$1,822,030	$1,859,951	$1,898,706	$1,938,314	$1,978,793	$2,020,162
Complete Streets	**6%**	$896,905	$915,456	$934,416	$953,793	$973,596	$993,835	$1,014,519	$1,035,658	$1,057,262	$1,079,341	$1,101,907
Climate Change & Environment	**2%**	$0	$0	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Congestion Relief	**2%**	$0	$0	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Transit Options	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Regional Access	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Community Access	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other	**0%**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Major Infrastructure Project - Rt 2 at S. Athol Rd		$7,116,559	$7,116,559									
	100%	$14,948,409	$15,257,602	$15,573,598	$15,896,545	$16,226,598	$16,563,911	$16,908,645	$17,260,964	$17,621,033	$17,989,024	$18,365,111

Scenario 2 (Multiple Hubs) - Scenario 2 seeks to promote and emphasize the longer transportation networks that connect one town to another. This promotes inter (or between) community access at the cost of the in-town transportation networks. The following breakdowns in funding are provided for scenario 2.

Table 10-16: Scenario 2 Funding Categories

	Funding Percentage Per Strategy Federal Aid Target Funds Scenario 2 – Multiple Hubs	Total Allocation % to Funding Category	Allocated % Funding Towards Inter Community Network	Allocated % Towards Remaining Projects
1	Road Maintenance & Infrastructure	40%	30%	10%
2	Transit Options	14%	10%	4%
3	Pedestrian & Bicycle Facilities	12%	10%	2%
4	Safety (High Crash Locations)	9%	7%	2%
5	Climate Change & Environment	6%	4%	2%
6	Congestion Relief	4%	3%	1%
7	Complete Streets	5%	3%	2%
8	Regional Access	5%	5%	0%
9	Community Access	4%	4%	0%
10	Other	1%	1%	0%

Carrying these percentages through for 2020 to 2040, the following table illustrates the Montachusett MPO Target funds allocation for Scenario 2 – Multiple Hubs. The Major Infrastructure Project previously identified, Route 2 at South Athol Road Interchange & Bridge, is identified for funding in FFY's 2028, 2029, 2030 and 2031.

Table 10-17: Financial Plan – Scenario 2 Multiple Hubs

Funding Program	% Allocated	% Sub Allocated	FFY 2020-2024 TIP 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
			$10,636,366	$10,851,652	$11,072,618	$11,314,453	$11,462,749	$11,645,841	$11,830,431	$12,516,810	$12,806,462	$14,645,872
			$55,337,838							**$63,445,416**		
Road Maintenance & Infrastructure	**40%**		$6,455,865	$8,241,745	$8,318,169	$10,820,246	$11,344,800	$4,658,336	$4,732,172	$5,006,724	$567,318	$1,464,587
Multiple Hubs - Inter-Community		30%						$3,493,752	$3,549,129	$3,755,043	$0	$0
		10%						$1,164,584	$1,183,043	$1,251,681	$567,318	$1,464,587
Safety	**9%**		$1,055,190	$1,047,285	$550,714	$0	$0	$1,048,126	$1,064,739	$1,126,513	$256,129	$352,836
Multiple Hubs - Inter-Community		7%						$815,209	$828,130	$876,177	$0	$59,919
		2%						$232,917	$236,609	$250,336	$256,129	$292,917
Pedestrian & Bicycle Facilities	**12%**		$1,055,190	$0	$110,145	$0	$0	$1,397,501	$1,419,652	$1,502,017	$1,536,775	$1,757,505
Multiple Hubs - Inter-Community		10%						$1,164,584	$1,183,043	$1,251,681	$1,280,646	$1,464,587
		2%						$232,917	$236,609	$250,336	$256,129	$292,917
Complete Streets	**5%**		$0	$0	$0	$0	$0	$582,292	$591,522	$625,841	$640,323	$732,294
Multiple Hubs - Inter-Community		3%						$349,375	$354,913	$375,504	$384,194	$439,376
		2%						$232,917	$236,609	$250,336	$256,129	$292,917
Climate Change & Environment	**6%**		$1,266,256	$1,047,285	$1,321,714	$0	$0	$698,750	$709,826	$751,009	$256,129	$292,917
Multiple Hubs - Inter-Community		4%						$465,834	$473,217	$500,672	$0	$0
		2%						$232,917	$236,609	$250,336	$256,129	$292,917
Congestion Relief	**4%**		$0	$0	$0	$0	$0	$465,834	$473,217	$500,672	$0	$146,459
Multiple Hubs - Inter-Community		3%						$349,375	$354,913	$375,504	$0	$0
		1%						$116,458	$118,304	$125,168	$0	$146,459
Transit Options	**14%**		$0	$0	$0	$0	$0	$1,630,418	$1,656,260	$1,752,353	$1,792,905	$2,050,422
Multiple Hubs - Inter-Community		10%						$1,164,584	$1,183,043	$1,251,681	$1,280,646	$1,464,587
		4%						$465,834	$473,217	$500,672	$512,258	$585,835
Regional Access	**5%**		$0	$0	$0	$0	$0	$582,292	$591,522	$625,841	$0	$0
Multiple Hubs - Inter-Community		5%						$582,292	$591,522	$625,841	$0	$0
		0%						$0	$0	$0	$0	$0
Community Access	**4%**		$0	$0	$0	$0	$0	$465,834	$473,217	$500,672	$512,258	$585,835
Multiple Hubs - Inter-Community		4%						$465,834	$473,217	$500,672	$512,258	$585,835
		0%						$0	$0	$0	$0	$0
Other	**1%**	1%	$0	$0	$0	$0	$0	$116,458	$118,304	$125,168	$128,065	$146,457.72
Major Infrastructure Project - Rt 2 at S. Athol Rd											$7,116,559	$7,116,559
		100%	$9,832,501	$10,336,315	$10,300,742	$10,820,246	$11,344,800	$11,645,841	$11,830,431	$12,516,810	$12,806,462	$14,645,872

Table 10-17: Financial Plan – Scenario 2 Multiple Hubs (continued)

Funding Program	% Allocat'd	% Sub Allocat'd	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
			$14,948,409	$15,257,603	$15,573,598	$15,896,545	$16,226,598	$16,563,911	$16,908,645	$17,260,964	$17,621,033	$17,989,024	$18,365,111
					$77,902,753					**$86,343,576**			**$18,365,111**
Road Maintenance & Infrastructure	**40%**		$1,494,841	$1,525,760	$6,229,439	$6,358,618	$6,490,639	$6,625,564	$6,763,458	$6,904,386	$7,048,413	$7,195,610	$7,346,044
Multiple Hubs - Inter-Community		30%	$0	$0	$4,672,079	$4,768,964	$4,867,979	$4,969,173	$5,072,594	$5,178,289	$5,286,310	$5,396,707	$5,509,533
		10%	$1,494,841	$1,525,760	$1,557,360	$1,589,655	$1,622,660	$1,656,391	$1,690,865	$1,726,096	$1,762,103	$1,798,902	$1,836,511
Safety	**9%**		$507,130	$664,818	$1,401,624	$1,430,689	$1,460,394	$1,490,752	$1,521,778	$1,553,487	$1,585,893	$1,619,012	$1,652,860
Multiple Hubs - Inter-Community		7%	$208,161.63	$359,666.21	$1,090,152	$1,112,758	$1,135,862	$1,159,474	$1,183,605	$1,208,267	$1,233,472	$1,259,232	$1,285,558
		2%	$298,968	$305,152	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Pedestrian & Bicycle Facilities	**12%**		$1,793,809	$1,830,912	$1,868,832	$1,907,585	$1,947,192	$1,987,669	$2,029,037	$2,071,316	$2,114,524	$2,158,683	$2,203,813
Multiple Hubs - Inter-Community		10%	$1,494,841	$1,525,760	$1,557,360	$1,589,655	$1,622,660	$1,656,391	$1,690,865	$1,726,096	$1,762,103	$1,798,902	$1,836,511
		2%	$298,968	$305,152	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Complete Streets	**5%**		$747,420	$762,880	$778,680	$794,827	$811,330	$828,196	$845,432	$863,048	$881,052	$899,451	$918,256
Multiple Hubs - Inter-Community		3%	$448,452	$457,728	$467,208	$476,896	$486,798	$496,917	$507,259	$517,829	$528,631	$539,671	$550,953
		2%	$298,968	$305,152	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Climate Change & Environment	**6%**		$298,968	$305,152	$934,416	$953,793	$973,596	$993,835	$1,014,519	$1,035,658	$1,057,262	$1,079,341	$1,101,907
Multiple Hubs - Inter-Community		4%	$0	$0	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
		2%	$298,968	$305,152	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Congestion Relief	**4%**		$149,484	$152,576	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
Multiple Hubs - Inter-Community		3%	$0	$0	$467,208	$476,896	$486,798	$496,917	$507,259	$517,829	$528,631	$539,671	$550,953
		1%	$149,484	$152,576	$155,736	$158,965	$162,266	$165,639	$169,086	$172,610	$176,210	$179,890	$183,651
Transit Options	**14%**		$2,092,777	$2,136,064	$2,180,304	$2,225,516	$2,271,724	$2,318,948	$2,367,210	$2,416,535	$2,466,945	$2,518,463	$2,571,116
Multiple Hubs - Inter-Community		10%	$1,494,841	$1,525,760	$1,557,360	$1,589,655	$1,622,660	$1,656,391	$1,690,865	$1,726,096	$1,762,103	$1,798,902	$1,836,511
		4%	$597,936	$610,304	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
Regional Access	**5%**		$0	$0	$778,680	$794,827	$811,330	$828,196	$845,432	$863,048	$881,052	$899,451	$918,256
Multiple Hubs - Inter-Community		5%	$0	$0	$778,680	$794,827	$811,330	$828,196	$845,432	$863,048	$881,052	$899,451	$918,256
		0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Community Access	**4%**		$597,936	$610,304	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
Multiple Hubs - Inter-Community		4%	$597,936	$610,304	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
		0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other	**1%**	1%	$149,484	$152,576	$155,736	$158,965	$162,266	$165,639	$169,086	$172,610	$176,210	$179,890	$183,651
Major Infrastructure Project - Rt 2 at S. Athol Rd			$7,116,559	$7,116,559									
		100%	$14,948,409	$15,257,603	$15,573,598	$15,896,545	$16,226,598	$16,563,911	$16,908,645	$17,260,964	$17,621,033	$17,989,024	$18,365,111

Scenario 3 (Strong Community Centers) - Scenario 3 places the priority on projects that promote travel within (or intra) the community. An emphasis on funding a shorter more contained transportation network promotes a more vibrant town center. The following breakdowns in funding are provided for scenario 3.

Table 10-18: Scenario 3 Funding Categories

	Funding Percentage Per Strategy Federal Aid Target Funds Scenario 2 – Multiple Hubs	Total Allocation % to Funding Category	Allocated % Funding Towards Intra Community Network	Allocated % Towards Remaining Projects
1	Road Maintenance & Infrastructure	40%	30%	10%
2	Transit Options	14%	10%	4%
3	Pedestrian & Bicycle Facilities	12%	10%	2%
4	Safety (High Crash Locations)	9%	7%	2%
5	Climate Change & Environment	6%	4%	2%
6	Congestion Relief	4%	3%	1%
7	Complete Streets	5%	3%	2%
8	Regional Access	5%	5%	0%
9	Community Access	4%	4%	0%
10	Other	1%	1%	0%

Carrying these percentages through for 2020 to 2040, the following table illustrates the Montachusett MPO Target funds allocation for Scenario 3 – Strong Community Centers. The Major Infrastructure Project previously identified, Route 2 at South Athol Road Interchange & Bridge, is identified for funding in FFY's 2028, 2029, 2030 and 2031.

Table 10-19: Financial Plan – Scenario 3 Strong Community Centers

Funding Program	% Allocated	% Sub Allocated	FFY 2020-2024 TIP 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
			$10,636,366	$10,851,652	$11,072,618	$11,314,453	$11,462,749	$11,645,841	$11,830,431	$12,516,810	$12,806,462	$14,645,872
			$55,337,838							**$63,445,416**		
Road Maintenance & Infrastructure	**40%**		$6,455,865	$8,241,745	$8,318,169	$10,820,246	$11,344,800	$4,658,336	$4,732,172	$5,006,724	$759,415	$2,094,462
		10%						$1,164,584	$1,183,043	$1,251,681	$0	$0
Strong Centers - Intra-Community		30%						$3,493,752	$3,549,129	$3,755,043	$759,415	$2,094,462
Safety	**9%**		$1,055,190	$1,047,285	$550,714	$0	$0	$1,048,126	$1,064,739	$1,126,513	$448,226	$308,796
		2%						$232,917	$236,609	$250,336	$0	$0
Strong Centers - Intra-Community		7%						$815,209	$828,130	$876,177	$448,226	$308,796
Pedestrian & Bicycle Facilities	**12%**		$1,055,190	$0	$110,145	$0	$0	$1,397,501	$1,419,652	$1,502,017	$1,536,775	$1,757,505
		2%						$232,917	$236,609	$250,336	$256,129	$292,917
Strong Centers - Intra-Community		10%						$1,164,584	$1,183,043	$1,251,681	$1,280,646	$1,464,587
Complete Streets	**5%**		$0	$0	$0	$0	$0	$582,292	$591,522	$625,841	$640,323	$732,294
		2%						$232,917	$236,609	$250,336	$256,129	$292,917
Strong Centers - Intra-Community		3%						$349,375	$354,913	$375,504	$384,194	$439,376
Climate Change & Environment	**6%**		$1,266,256	$1,047,285	$1,321,714	$0	$0	$698,750	$709,826	$751,009	$0	$0
		2%						$232,917	$236,609	$250,336	$0	$0
Strong Centers - Intra-Community		4%						$465,834	$473,217	$500,672	$0	$0
Congestion Relief	**4%**		$0	$0	$0	$0	$0	$465,834	$473,217	$500,672	$0	$0
		1%						$116,458	$118,304	$125,168	$0	$0
Strong Centers - Intra-Community		3%						$349,375	$354,913	$375,504	$0	$0
Transit Options	**14%**		$0	$0	$0	$0	$0	$1,630,418	$1,656,260	$1,752,353	$1,792,905	$2,050,422
		4%						$465,834	$473,217	$500,672	$512,258	$585,835
Strong Centers - Intra-Community		10%						$1,164,584	$1,183,043	$1,251,681	$1,280,646	$1,464,587
Regional Access	**5%**		$0	$0	$0	$0	$0	$582,292	$591,522	$625,841	$0	$0
		5%						$582,292	$591,522	$625,841	$0	$0
Strong Centers - Intra-Community		0%						$0	$0	$0	$0	$0
Community Access	**4%**		$0	$0	$0	$0	$0	$465,834	$473,217	$500,672	$512,258	$585,835
		0%						$0	$0	$0	$0	$0
Strong Centers - Intra-Community		4%						$465,834	$473,217	$500,672	$512,258	$585,835
Other	**1%**	1%	$0	$0	$0	$0	$0	$116,458	$118,304.31	$125,168	$0	$0
Major Infrastructure Project - Rt 2 at S. Athol Rd											$7,116,559	$7,116,559
		100%	$9,832,501	$10,336,315	$10,300,742	$10,820,246	$11,344,800	$11,645,841	$11,830,431	$12,516,810	$12,806,462	$14,645,872

Table 10-19: Financial Plan – Scenario 3 Strong Community Centers (continued)

Funding Program	% Allocat'd	% Sub Allocat'd	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
			$14,948,409	$15,257,603	$15,573,598	$15,896,545	$16,226,598	$16,563,911	$16,908,645	$17,260,964	$17,621,033	$17,989,024	$18,365,111
					$77,902,753					**$86,343,576**			**$18,365,111**
Road Maintenance & Infrastructure	**40%**		$2,253,518	$2,257,860	$6,229,439	$6,358,618	$6,490,639	$6,625,564	$6,763,458	$6,904,386	$7,048,413	$7,195,610	$7,346,044
		10%	$0	$0	$1,557,360	$1,589,654	$1,622,660	$1,656,391.10	$1,690,865	$1,726,096	$1,762,103	$1,798,902	$1,836,511
Strong Cntrs - Intra-Community		30%	$2,253,518	$2,257,860	$4,672,079	$4,768,963	$4,867,979	$4,969,173	$5,072,594	$5,178,289	$5,286,310	$5,396,707	$5,509,533
Safety	**9%**		$346,389	$543,023	$1,401,624	$1,430,689	$1,460,394	$1,490,752	$1,521,778	$1,553,487	$1,585,893	$1,619,012	$1,652,860
		2%	$0	$0	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Strong Cntrs - Intra-Community		7%	$346,389	$543,023	$1,090,152	$1,112,758	$1,135,862	$1,159,474	$1,183,605	$1,208,267	$1,233,472	$1,259,232	$1,285,558
Pedestrian & Bicycle Facilities	**12%**		$1,793,809	$1,830,912	$1,868,832	$1,907,585	$1,947,192	$1,987,669	$2,029,037	$2,071,316	$2,114,524	$2,158,683	$2,203,813
		2%	$298,968	$305,152	$311,472	$317,931	$324,532	$331,278.22	$338,173	$345,219	$352,421	$359,780	$367,302
Strong Cntrs - Intra-Community		10%	$1,494,841	$1,525,760	$1,557,360	$1,589,655	$1,622,660	$1,656,391	$1,690,865	$1,726,096	$1,762,103	$1,798,902	$1,836,511
Complete Streets	**5%**		$747,420	$762,880	$778,680	$794,827	$811,330	$828,196	$845,432	$863,048	$881,052	$899,451	$918,256
		2%	$298,968	$305,152	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Strong Cntrs - Intra-Community		3%	$448,452	$457,728	$467,208	$476,896	$486,798	$496,917	$507,259	$517,829	$528,631	$539,671	$550,953
Climate Change & Environment	**6%**		$0	$0	$934,416	$953,793	$973,596	$993,835	$1,014,519	$1,035,658	$1,057,262	$1,079,341	$1,101,907
		2%	$0	$0	$311,472	$317,931	$324,532	$331,278	$338,173	$345,219	$352,421	$359,780	$367,302
Strong Cntrs - Intra-Community		4%	$0	$0	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
Congestion Relief	**4%**		$0	$0	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
		1%	$0	$0	$155,736	$158,965	$162,266	$165,639	$169,086	$172,610	$176,210	$179,890	$183,651
Strong Cntrs - Intra-Community		3%	$0	$0	$467,208	$476,896	$486,798	$496,917	$507,259	$517,829	$528,631	$539,671	$550,953
Transit Options	**14%**		$2,092,777	$2,136,064	$2,180,304	$2,225,516	$2,271,724	$2,318,948	$2,367,210	$2,416,535	$2,466,945	$2,518,463	$2,571,116
		4%	$597,936	$610,304	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
Strong Cntrs - Intra-Community		10%	$1,494,841	$1,525,760	$1,557,360	$1,589,655	$1,622,660	$1,656,391	$1,690,865	$1,726,096	$1,762,103	$1,798,902	$1,836,511
Regional Access	**5%**		$0	$0	$778,680	$794,827	$811,330	$828,196	$845,432	$863,048	$881,052	$899,451	$918,256
		5%	$0	$0	$778,680	$794,827	$811,330	$828,196	$845,432	$863,048	$881,052	$899,451	$918,256
Strong Cntrs - Intra-Community		0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Community Access	**4%**		$597,936	$610,304	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
		0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Strong Cntrs - Intra-Community		4%	$597,936	$610,304	$622,944	$635,862	$649,064	$662,556	$676,346	$690,439	$704,841	$719,561	$734,604
Other	**1%**	1%	$0	$0	$155,736	$158,965	$162,266	$165,639	$169,086	$172,610	$176,210	$179,890	$183,651
Major Infrastructure Project - Rt 2 at S. Athol Rd			$7,116,559	$7,116,559									
		100%	$14,948,409	$15,257,603	$15,573,598	$15,896,545	$16,226,598	$16,563,911	$16,908,645	$17,260,964	$17,621,033	$17,989,024	$18,365,111

Highway Conclusion

Fiscal constraint was achieved in the three scenarios presented by including identified and assumed needs within the assumed available funds. A major factor in future financial planning in the region will be the monitoring of assets such as bridge and pavements and needs such as safety improvements and congestion relief. As the conditions of these assets and needs change so must resources allocated to these factors. Remaining available funds will be used to fund these projects as they arise.

Transit Conclusion

Fiscal constraint was demonstrated through forecast tables which act as a guide for possible funding through 2040. In the first 5 years of the RTP (2020-2024) fiscal constraint was demonstrated through the projects listed on the 2020-2024 TIP and available funds. As with the highway network, any additional available funds for the transit system will be utilized in an attempt to further expand options available to the region. Several needs have been identified within this RTP that highlight the potential to broaden the reach and use of transit to serve multiple purposes from medical to commercial.

Appendix 1- Public Participation Comments

Comments from RTP Public Meetings

Meeting	Comments
2/21/19 – Fitchburg/Leominster Outreach	Route 2 - Improvements needed. • Mt. Elam Road – dangerous traffic light. Suggestion to buy out property owners and close roadway/eliminate light. Emergency response is also delayed to accidents at the light because it's in Fitchburg and they will be coming westbound and need to turn around to head eastbound where the light is located. More up to date & visible advanced warning signage is needed prior to the light. Solar glare is also a problem here. • Runoff into Monoosnoc Brook near the water filtration plant. MDOT settled a lawsuit against them 8+ years ago. A plan was established to fix the issues but it appears that no work has been done. Route I-190 • Advanced warning signs needed before the merge with Route 2 Prioritize Complete Streets & trail connections Trail priorities – • Connect Twin Cities Rail Trail to the Mass Central Rail Trail • Connect North Central Pathway into Ashburnham and points West • MRTC to work on this at upcoming meetings Game On Fitchburg is currently being built. This is an economic development opportunity. It was mentioned that "active" people will be coming out to this facility so hiking & biking opportunities nearby may be of interest. Route 31 railroad bridge in West Fitchburg is a pinch point. This should be expanded to accommodate the heavy truck traffic and also provide a safe place to connect the Streamline Trail to Wachusett Station.
2/21/19 – Fitchburg/Leominster Outreach	Route 12 corridor in Fitchburg – potential TIP project. The area closer to down town and to the north. Sidewalks/pedestrian & bike improvements are needed.
2/28/19 – Harvard Outreach	• Route 117 – Willard Road, no sidewalks. This is a mode shift barrier • No Park & Ride facilities in Harvard or along Route 2 in the area • Ayer Road corridor – good candidate for a bike lane to connect Ayer Center to Harvard Center and to the Nashua River Rail Trail • Devens – trail connections to Harvard (Old Mill Road), connect Ayer rotary area • Encourage strategic connections (future planning) for future TIP projects • Encourage people to force trail/bike/ped accommodates for projects that could create future trail connections
3/4/19 – Ayer Outreach	• More Ch. 90 money needed, current funding levels have been the same for a number of years and it is impossible for communities to keep up with maintenance of their roads. • Project costs/process is out of control. A community spends much less money than the state on similar projects.
3/5/19 – Phillipston Outreach	• UPWP project conversation • TIP project process

3/12/19 – Winchendon Outreach	• No grocery store in town, need better access to grocery store for people without access to car/seniors. • MART needs to do a better job of communicating bus service to the public. Active community members from Winchendon had no clue what service was available. • North Central Pathway and its possible connections to Monadnock region and its assets would boost economy of Winchendon.

Comments from Online Comment App

Comment App	Comment Type	Response
Federal Aid Roads & Pavement Conditions	Accident Locations; Geometric Deficiencies; Intersection or Locations That Need to be Addressed; Enforcement Areas; Speed Issues; Pavement Issues	Specific locations were noted and will be reviewed as part of Safety Analysis or possible future UPWP planning task.
Safety & Freight	Geometric Deficiencies; Areas of Congestion; Improper Motorist Behavior; Truck Access Issues; Accident Issues & Locations	Areas of concern will be addressed in current or planned work activities. This includes freight issues and safety analysis programs.
Trails	Trail Support; Bicycle Usage Support	Trail support will be noted in planned Regional Bicycle and Pedestrian Plans.
Evacuation Routes	Facility Update	Routes discussed as part of Homeland Security participation work.
Bridges, Environmental Justice, Title VI	No Comments Provided	

Comments from Survey Questions

Survey Question 4

Senior Issues
* Senior Housing, a Senior Center, a LGBT friendly community * Harvard is minimally invested in its Senior Citizens COA. We have NO Van of our own. Most importantly, we have NO VAN to take Seniors into Boston for medical appointments. This is vitally important, as all my doctors are in Boston. And their current arrangement to 'drop off' Seniors at a nearby town's rapid transit stop (Littleton) is hardly appropriate for seniors unable to navigate train stations and then walk to hail cabs! * Reliable van service for seniors * Senior housing opportunities
Mobility/Bicycle & Pedestrian Accessibility
* Community connections * As medical services become more and more dependent on independent travel, transportation is needed. * Recreation availability, in town transportation availability * Transportation from rural communities to places they work, healthcare and education. This is extremely important for our area. * Bicycle safety on our roads * Sidewalks and bike lanes * I didn't answer other. Climate concerns are real but secondary in this questionnaire. I would take a bus if i could. Or a train. Or a bike. Or walk.

Open Space/Historic Preservation
* Preservation of historic buildings and community fabric in the face of over-development and excessive automobile traffic Linked open space/ bike trails * Recreational opportunities and tourism * Protection from development near water supply, wetlands, and streams. Non-point source runoff. * Better protection for local waters, i.e. 1, replace culverts to meet DER standards for passage; 2, promote open space; 3, reduce road runoff/road salt * Acquisition of open space/multi-purpose trails, including equestrian access
Other
* Education * Population health/health equity/SDOH * Overall quality of life; viable food system; sense of belonging * Use of sand on roads during Winter whenever it snows needs to be abolished immediately as it causes dirt after the snow melts and clogs sewer/drainage systems. * Social and economic too many people living In poverty * Overall road safety is horrible. * Business/Industrial Park needs to be in the 20-year plan. Rezoning parcels on Route 12 and continuing the water supply in order to do this will be key to any economic future of the town. * Healthcare * Harvard is a town out of balance. Over 90% of property tax revenue goes to public schools run like private ones. Schools get all. Seniors are marginalized, severely underserved…..

Survey Question 5

RURAL - MRPC Region Only		
Community	Comment	Applicable Strategy
Municipal Employees & Officials		
Harvard	Sidewalks and trails	Pedestrian & Bicycle Facilities
Townsend	Sidewalks	Pedestrian & Bicycle Facilities
General Public		
Ashburnham	Commuter rail service	Transit Options
Harvard	Availability for independent travel for medical needs, other individual needs $50	Transit Options; Community & Regional Access
Harvard	$100 to the COA for a van that can travel into Boston	Transit Options; Community & Regional Access
Shirley	Turn the rail line, in Ayer, heading to West Groton into a road. This will relieve traffic on Lawton Road & 111 (past Tiny's); Add a Market Basket to Devens	Community & Regional Access
Townsend	Connecting towns together by trails - bike / walking	Pedestrian & Bicycle Facilities
Townsend	Decrease pollution/climate change and congestion by improving bike and pedestrian access.	Pedestrian & Bicycle Facilities; Climate Change & Environment
Townsend	Explore better town management systems	Local Management
Winchendon	Tourism & Recreation	Tourism; Recreation

URBAN - MRPC Region Only		
Community	Comment	Applicable Strategy
Municipal Employees & Officials		
Fitchburg	Use people and fundraisers for many projects. Charge permits for using the rail trail. Put more police officers out in high crash locations. Try earning money for projects instead of taking money ahead of time.	Local Management; Safety (High Crash Locations)
Gardner	Stormwater Infrastructure	Stormwater; Climate Change & Environment
Lunenburg	Stormwater; keeping it off the roads and keeping it from flooding our roadways and polluting our waters	Stormwater; Climate Change & Environment
General Public		
Fitchburg	Access to Route 2	Community & Regional Access

Survey Question 6

Rural		
Harvard	Municipal Official	Sustainable, rural, smart agritourism community w/return of jurisdiction of Devens as economic base diversifier/engine.
Hubbardston	Municipal Official	I think the population will continue to grow slightly but the school age population has declined sharply and is likely to continue to, unless we can attract young families.
Harvard	General Public	Seeking senior housing and business development.
Harvard	General Public	Poorly governed town, run by insiders and those with an agenda. People move here for schools only, care about themselves & not the whole town. They are affluent and entitled. Not invested in this place, they leave after kids graduate. Leaving long term school dept behind. Harvard's Seniors are underserved and devalued.
Harvard	General Public	Rural residential - low key industry - way more trees than people. Keep it rural.
Winchendon	General Public	If little changes, a stagnant community with lots of aspirations, but not quite succeeding.
Urban		
Lunenburg	Municipal Official	Farming, hopefully
Fitchburg	General Public	Clean and desirable living environment with good infrastructure and public amenities like parks. Good schools.

Survey Question 7

Rural		
Groton	Municipal Employee	A residential community with housing available to all demographic types and needs while preserving environmental diversity and habitat
Harvard	Municipal Official	Up & coming bc it has planned for future development ie managed growth impacts like traffic, values rural, sustainable growth, retains its natural beauty & resources, supports strong schools, regains Devens to financially support smart growth policies.
Hubbardston	Municipal Official	Regional tourist destination for outdoor recreation
Lancaster	Municipal Official	A turn around to ethical and improved government integrity
Ashburnham	General Public	Part of a region wide network supporting local Ag, small businesses and micro grids for energy
Ashburnham	General Public	Quiet rural alternative to suburbia
Ashby	General Public	Resilient, 50% Art. 97 protected open space
Groton	General Public	Sustainable, Accessible, Pedestrian & Bike Friendly
Groton	General Public	Arts & recreation destination
Harvard	General Public	A Senior friendly community with outstanding public schools.
Harvard	General Public	Rural residential with as much open space and nature as possible.
Harvard	General Public	Stable community
Harvard	General Public	Conservation-minded leading by example community
West Townsend	General Public	Townsend - a friendly town that has lots of open space, supports it elderly, veterans, schools and local churches AND continues its charm with Summer Band Concerts on the Common!
Urban		
Fitchburg	Municipal Employee	Well balanced
Lunenburg	Municipal Official	Farming, hopefully
Fitchburg	General Public	Improved socioeconomic
Leominster	General Public	Green community including transportation

Survey Question 8

Senior Issues
Rural
- Transportation options for seniors and disabled is the number ONE issue we deal with. - Seniors need services or we will lose them! - In Harvard ... concerned about getting around town… to services in nearby towns when I have to give up driving ... - Need better senior housing opportunities and better van or other transportation opportunities for seniors - Senior transit and housing

Mobility/Transit Options
Rural
- Groton needs bus and other shared ride options. - ...more should be done so that people can work in the community that they live in and not have to commute 30-60 miles away ... to work. Ideally, people should be able to walk or bike to work - We need more travel options in and out of town. - Help with access to highways/jobs. 20 minutes to highways means no younger home buyers which leads to aging and stagnation - ... if we devote more resources to mass transportation, bicycle and pedestrian travel, that should help reduce single-occupant automobile traffic - We need better access to Rt 2 whether by highway or train. - Enhance access to the commuter rail for residents of neighboring communities. ... a shuttle twice a day from Harvard to the Ayer, Littleton, or South Acton stations. - Harvard needs transit options for all citizens to save the environment and give non-drivers quality of life - Need to broaden accessibility of transportation systems including vac services for seniors and disabled - Must help improve the quality of life by reducing the commute to Boston/ inside 495 - As a very rural area...most accommodations at least 8-10 miles away... need for transportation for...less fortunate population is a must...While...buses are available, the schedule is nearly non-existent, and that could easily be changed. - Fixed the commuter rail. The congestion and wider region transit goals cannot be met without a strong and vibrant mass transit option to Boston.
Urban
- We need to link Leominster MART and Worcester WRTA! The WRTA Route 30 and Leominster Jytek link! - I believe we should continue to work to improve transportation infrastructure within our region, especially long distance trails and bike path/greenways (not emphasized in this survey). However, I believe we also need to advocate strongly for improvements to Route 2 through Concord to eliminate that "bottleneck" congestion problem associated with the rotary and cross-traffic. It is long overdue and affects thousands of commuters from this region each day. While this is outside of our region, I believe it is important to the social, cultural, and economic success of the Montachusett Region. - Use riverway and rail lines for accessible trails coupled with transit. On road routes should be barrier-protected.

Bicycle & Pedestrian Accessibility
Rural
- Making Townsend walkable - both pedestrian and hiking - would be great. - The more we make our communities walkable and bikeable, the better life will be in them. - …would love more sidewalks and sidewalk to bike path/long-distance mixed-use trail connections. Once you are home, you should be able to take a safe walk through your community. - Being able to get around rt 119 on a bicycle is key for me. Plus, more protected land around the watershed. - Plant more trees downtown; include bicycle lane on roads

Other
Rural
- Tree removal at roadsides where they interfere with power lines if they fall...they loom dangerously over...roads. - less development; more land conservation and historic preservation. - Ashburnham does not do something to rein in spending... the current lack of upkeep on infrastructure will...lead to unnecessary spending...roads... just paved in last 5 years...already showing signs of breakdown because crack-sealing has never been a priority. The DPW needs ...resource management software. - Education is number 1 in importance...to support this, the community needs to grow in population and in industry and commerce. - The Town needs to do better on maintaining their facilities. - With the population decreasing, we need to adapt our schools' systems, transportation and tax base. - ...town of Harvard is losing its younger population due to costly real estate, taxes, low commercial development... As a result, the retired older pop. is footing more and more of the tax burden thus forcing them to consider…leaving. - I would like to see it more as a diverse community that invests in keeping people as they age by meeting their needs such as a strong COA, housing options that prevent isolation, down to simple things such as level walking paths. - More commercial entities. - Increased traffic pressure from outside Harvard and the growing concern for safety and speed limit enforcement have the potential to dramatically impact safety and lessen the enjoyment of the rural qualities of our town for everyone. - There needs to be more retail in our area. A large scale build up would increase foot-traffic and raise housing prices. Also, our schools would improve. - Open space is paramount to keeping 01469 a bedroom place forever - Town and State groups more closely together. Maybe forums set quarterly around the state to meet with groups of towns on transportation issues to obtain a broader perspective on where the citizens would like us to move. - If we don't start working on climate change, we won't have a future to worry about. - Townsend does not have enough local business for tax support. A lot of the burden of infrastructure improvements lay on the tax payers. This does not lead to positive feedback from the community when trying to enact positive changes for the future of the town. - More work needs to be done to develop an across-community regional identity for North Central MA.
Urban
- Describe Fitchburg in next 10 years as Fitchburg as regional destination for arts and culture with a strong mixed-use portfolio- it is a vibrant hub to an integrated transportation system

Appendix 2- Maps

Montachusett Regional Planning Commission: Roadway Functional Classification

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
ROYALSTON
WARWICK
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
LITTLETON
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
HARVARD
BOXBOROUGH
ACTON
HUBBARDSTON
LANCASTER
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
MARLBOROUGH
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

Legend

- Urban Areas (2010)
- Community Boundaries
- Active Rail Lines

Roadways

- Interstate
- Arterial
- Collector
- Local

0 2.5 5 10 Miles

/MRPC_RoadClassifications_2018/MRPC_RoadwayClassification_2018_11x17L.mxd [1:190,000] 09_26_18

Athol, MA:
Roadway Functional Classification

N
W E
S

ROYALSTON
ORANGE
PHILLIPSTON
PETERSHAM
NEW SALEM

Tully Lake
Tully Pond
Packard Pond
Sportsmans Pond
Silver Lake
Millers River
Lake Ellis
Paige Pond
Newton Reservoir
Phillipston Reservoir
Reservoir No. 1
Reservoir No. 2
Bates Power Reservoir
White Pond
Lake Rohunta
South Athol Pond
Riceville Pond
Davenport Pond
North Spectacle Pond
South Spectacle Pond

TULLY ROAD
DOANE HILL ROAD
ATHOL ROAD
ROYALSTON ROAD
JOLLY ROAD
SINIVOURI ROAD
DICKLEY ROAD
BLOSSOM STREET
MOUNTAIN ROAD
ROYALSTON ROAD
NORTH ORANGE ROAD
MILL YARD ROAD
FRYEVILLE ROAD
MAYO ROAD
WEST ROYALSTON ROAD
LOGAN ROAD
TOWNSEND ROAD
GULF ROAD
OLD KEENE ROAD
WILLIS ROAD
CHESTNUT HILL AVENUE
SCHOOLHOUSE
LOWER ROAD
CENTER DRIVE
MEMORIAL DRIVE
MEMORY LANE
ADAMS DRIVE
PINEDALE ROAD
SILVER LAKE STREET
WHEELER AVENUE
WARDS ROAD
EAST ROAD
BROOKS ROAD
NORTH ORANGE ROAD
BYRD AVENUE
PINEDALE AVENUE
FREDETTE STREET
LENOX STREET
ANZIO ROAD
BURMA ROAD
WARD STREET
CRESCENT STREET
PEQUOIG AVENUE
SHORE DRIVE
MAPLE STREET
UNION STREET
MAIN STREET
SCHOOL STREET
ALLEN STREET
GREEN STREET
CENTRAL STREET
GROVE STREET
HAPGOOD STREET
CHESTNUT STREET
SOUTH STREET
HARRISON STREET
SOUTH ATHOL ROAD
J STREET
I STREET
ENFIELD DRIVE
PRESCOTT LANE
DANA ROAD
BRICKYARD ROAD
BEARSDEN ROAD
SOUTH ROYALSTON ROAD
ROGERS AVENUE
NEW ATHOL ROAD
OLD STATE ROAD
SOUTH MAIN STREET
MORTON STREET
BROOKSIDE ROAD
RIVERVIEW AVENUE
HARVARD AVENUE
SANDERS STREET
WOOD STREET
COTTAGE STREET
ELM STREET
IVY DRIVE
MARSHALL STREET
SPRING STREET
VINE STREET
LAKE ELLIS ROAD
MAIN STREET
COLONIAL DRIVE
TEMPLETON ROAD
EUCLID STREET
GARFIELD ROAD
BALDWIN HILL ROAD
STATE ROAD
CHASE ROAD
PLEASANT STREET
RIDGE ROAD
DORSET ROAD
PETERSHAM ROAD
BOSMA ROAD
ATHOL ROAD
WARD HILL ROAD
BLAKE CORNER ROAD
FROMAN STREET
GAGE ROAD
PARTRIDGEVILLE ROAD
DANIEL SHAYS HIGHWAY
EAST RIVER STREET
THROWER ROAD
BATCHELDER ROAD
PLAINS ROAD
MOHAWK TRAIL
WHITE POND ROAD
CARPENTER ROAD
KING ROAD
HORTON ROAD
DOE VALLEY ROAD
CONANT ROAD
JEANNE D'ARCY DRIVE
VAUGHN ROAD
CAILAN WAY
BRIGGS ROAD
PROSPECT HILL ROAD
LINCOLN ROAD
WHITNEY ROAD
LEIGHTON ROAD
NORTH MAIN STREET
PIERCE ROAD
BIGELOW ROAD
ADAMS ROAD
TOM SWAMP ROAD
NEW SHERBORN ROAD
RICEVILLE ROAD
NELSON ROAD
BRANCH BRIDGE ROAD
WASHINGTON AVENUE
RICE STREET
MEACHUM ROAD
FLAT ROCK ROAD
WILLIAM RICE ROAD
WAITE ROAD
NEW ATHOL ROAD
MONSON TURNPIKE
TOM SWAMP ROAD
OLD NORTH DANA ROAD
OLD COUNTY ROAD
NEW SALEM ROAD

32
68
2A
2
202
122

DATA SOURCES: MassGIS, MassDOT, the Town of Athol and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

0 0.5 1 2 Miles

Legend

- Urban Areas (2010)
- Community Boundaries
- Active Rail Lines

Roadways

- Arterial
- Collector
- Local

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

/MRPC_RoadClassifications_2018/Athol_RoadwaysClassification_2018_11x17P.mxd [1:42,000] 09_26_18

Ayer, MA:
Roadways Functional Classification

SHIRLEY
GROTON
DEVENS
HARVARD
LITTLETON

Squannacook River
Nashua River
Groton School Pond
Pine Meadow Pond
Sandy Pond
Long Pond
Flanagan's Pond
Plow Shop Pond
Grove Pond
Robbins Pond
Spectacle Pond

JOY LANE
SHIRLEY ROAD
INDIAN HILL ROAD
NATE NUTTING ROAD
AUGUSTINE ROAD
OLD LANTERN LANE
ORBOW LANE
LAUREL LANE
DUCK POND ROAD
NEW POND ROAD
WHITLEY ROAD
FORGE VILLAGE ROAD
BOSTON ROAD
SUNSET BAYBERRY ROAD
SANDY POND ROAD
MOORS ROAD
FARMERS ROW
AMANDREY WAY
DOLAN DRIVE
DOUGLAS DRIVE
SMITH STREET
OLD DALE LANE
OLD AYER ROAD
AUTUMN RIDGE DRIVE
SNAKE HILL ROAD
RATTLESNAKE DRIVE
GROTON SHIRLEY ROAD
GROTON SCHOOL ROAD
ROSEWOOD AVENUE
VERNON STREET
MARK STREET
DOUG ROAD
JONATHAN DRIVE
GROTON ROAD
OLD WESTFORD ROAD
STRATTON HILL ROAD
TURTLE HILL RD
LOON HILL CIRCLE
HIBISCUS LANE
MULBERRY CIRCLE
NEMCO WAY
WESTFORD ROAD
RADISON DRIVE
WAGON ROAD
GREAT ROAD
KITTREDGE ROAD
GREAT ROAD
FITCHBURG ROAD
BISHOP ROAD
BROOK STREET
WALKER ROAD
MACPHERSON ROAD
PARK STREET
TAFT STREET
PEARL STREET
JACKSON STREET
PLEASANT STREET
WASHINGTON STREET
MASHUA STREET
HIGHLAND AVENUE
HIGH STREET
WILLIAM STREET
CAMBRIDGE STREET
MOORE DRIVE
GROTON HARVARD ROAD
PIERCE ROAD
CALVIN STREET
HEDGEWAY STREET
WRIGHT ROAD
STANDISH AVENUE
MOUNTAIN LAUREL WAY
NEW ENGLAND WAY
SPECTACLE ROAD
BARON WAY
NICOLE LANE
CRICKET LANE
SPECTACLE POND ROAD
PATRICIA DRIVE
SHIRLEY STREET
MILL STREET
MAIN STREET
CENTRAL AVENUE
SCHOOL ROAD
GROVE STREET
BLIGH STREET
FLETCHER STREET
EAST MAIN STREET
THIRD STREET
WEST MAIN STREET
OAK RIDGE DRIVE
BIRCH STREET
FOX RUN DRIVE
WILLOW ROAD
LONGVIEW DRIVE
COPELAND DRIVE
HAYMEADOW LANE
OLD FARM WAY
WOODLAND WAY
HEMLOCK DRIVE
HICKORY WAY
SNAKE HILL ROAD
SHAKER ROAD
MYRICK STREET
WILLARD STREET
LITTLETON ROAD
BRUCE STREET
ROBBINS ROAD
PINGRY WAY
FOX LANE
HARVARD ROAD
BARNUM ROAD
HARVARD ROAD
AYER ROAD
MYRICK LANE
ANN LEE ROAD
BABBIT LANE
SIMON ATHERTON ROW
SHAKER ROAD
OLD MILL ROAD
PATTON ROAD
ELM ROAD
PINE ROAD
SARATOGA BOULEVARD
GRANT ROAD
EL CANEY STREET
BASS BLUFF STREET
SHERMAN AVENUE
JACKSON ROAD
ANTIETAM STREET
COOKE STREET
BUENA VISTA STREET
INDEPENDENCE DRIVE

2A
111
119
225
110

DATA SOURCES: MassGIS, MassDOT, the Town of Ayer and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

Legend

- Urban Areas (2010)
- Devens Boundary
- Community Boundaries
- Active Rail Lines

Roadways

- Arterial
- Collector
- Local

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

0 0.25 0.5 1 Miles

/MRPC_RoadClassifications_2018/Ayer_RoadwaysClassification_2018_11x17L.mxd [1:24,000] 09_26_18

Clinton, MA:
Roadway Functional Classification

LANCASTER
STERLING
BOLTON
BERLIN
BOYLSTON

Fitch Pond
Mossy Pond
South Meadow Pond
Coachlace Pond
East Wauchacum Pond
Wachusett Reservoir
Lancaster Mill Pond
Clamshell Pond
Nashua River

REDSTONE HILL
REDSTONE HILL ROAD
RUGG ROAD
MAPLE STREET
HAWKINS LANE
DEERSHORN ROAD
KELLY DRIVE
POULIN DRIVE
IVY DRIVE
PARKER ROAD
PILGRIM ROAD
MAYFLOWER DRIVE
MAGNOLIA AVENUE
LONGEDGE ROAD
DEWEY STREET
BROADWAY
GREELEY STREET
FARM LAND LANE
STERLING STREET
HIGHLAND STREET
FLAGG STREET
LEWIS STREET
MOFFETT STREET
RIGBY ROAD
RIGBY LANE
RIGBY STREET
WILLOW STREET
BROOK STREET
PARKER STREET
CLARK STREET
WEST STREET
EAST STREET
FOREST STREET
PLAIN STREET
HIGH STREET
STONE STREET
MARTIN STREET
ALLEN STREET
JEWETT COURT
CARTER STREET
WINSLOW STREET
ROSS STREET
GORHAM AVENUE
MILTON AVENUE
FARNSWORTH WAY
MILL STREET EXTENSION
SQUIRE SHALLEY
JOHN F KENNEDY AVENUE
WOODRUFF ROAD
NATHAN DRIVE
LANCASTER ROAD
FOX RUN DRIVE
BEAR PATH
OTIS STREET
LINCOLN STREET
KENT STREET
MOUNT VIEW DRIVE
OAK TRAIL
SAWYER ROAD
LANCASTER ROAD
SARGENT ROAD
BALLVILLE ROAD
WATOQUADOC ROAD
BOLTON ROAD
ELM STREET
BOURNE STREET
AUBURN STREET
PEARL STREET
LEIGHTON AVENUE
WATER STREET
ASH STREET
CHURCH STREET
UNION STREET
WALNUT STREET
CHESTNUT STREET
PRESCOTT STREET
CEDAR STREET
ORANGE STREET
BEECH STREET
BIRCH STREET
SPRUCE STREET
LARCH STREET
BRANCH STREET
CHIPMAN STREET
SCHOBERT STREET
PLEASANT STREET
NORMAN STREET
FRANKLIN STREET
BEACON STREET
GREEN STREET
BARRETT STREET
OAK RIDGE DRIVE
CHACE STREET
ROBERT STREET
COLLINS ROAD
PEACH HILL ROAD
LANCASTER ROAD
CROWN STREET
OAK STREET
CAMERON STREET
ACRE STREET
CLINTWOOD DRIVE
KILMURRAY STREET
LINDBERGH STREET
CANDICE STREET
BERLIN STREET
TOP STREET
WILSON STREET
MULBERRY DRIVE
CLAMSHELL ROAD
WOODLAND CIRCLE
DEVENWOOD
LEDGEWOOD WAY
WEST STREET
ALLEN ROAD
RANDALL ROAD
FRONT STREET
ARTHUR STREET
WINTER STREET
PARK STREET
SIMON COURT
RICHMAN STREET
GROVE STREET
JOHN STREET
DENNIS STREET
VINEYARD AVENUE
LANE AVENUE
TERRENCE AVENUE
MAIN STREET SOUTH
HARBOR STREET
ROGERS FIELD WAY
WOODLAWN STREET
SPRAGUE ROAD
BEACH POINT ROAD
COLE FARM ROAD
HEMLOCK LANE
FITCH ROAD
LYDIA LANE
RUNAWAY BROOK ROAD
GREAT POND WAY
KENDALL HILL ROAD
FITCH FARM LANE
JENKINS STREET
SWETT HILL ROAD
HALL AVENUE
MORGAN AVENUE
MAIN STREET
METROPOLITAN ROAD
CHACE HILL ROAD
BOYLSTON STREET
WILLOW ROAD
BOYLSTON ROAD
LARKIN ROAD
MAIN STREET
CHACE HILL ROAD

62
70
110

0 0.25 0.5 1 Miles

Legend

- Urban Areas (2010)
- Community Boundaries
- Active Rail Lines

Roadways

- Arterial
- Collector
- Local

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

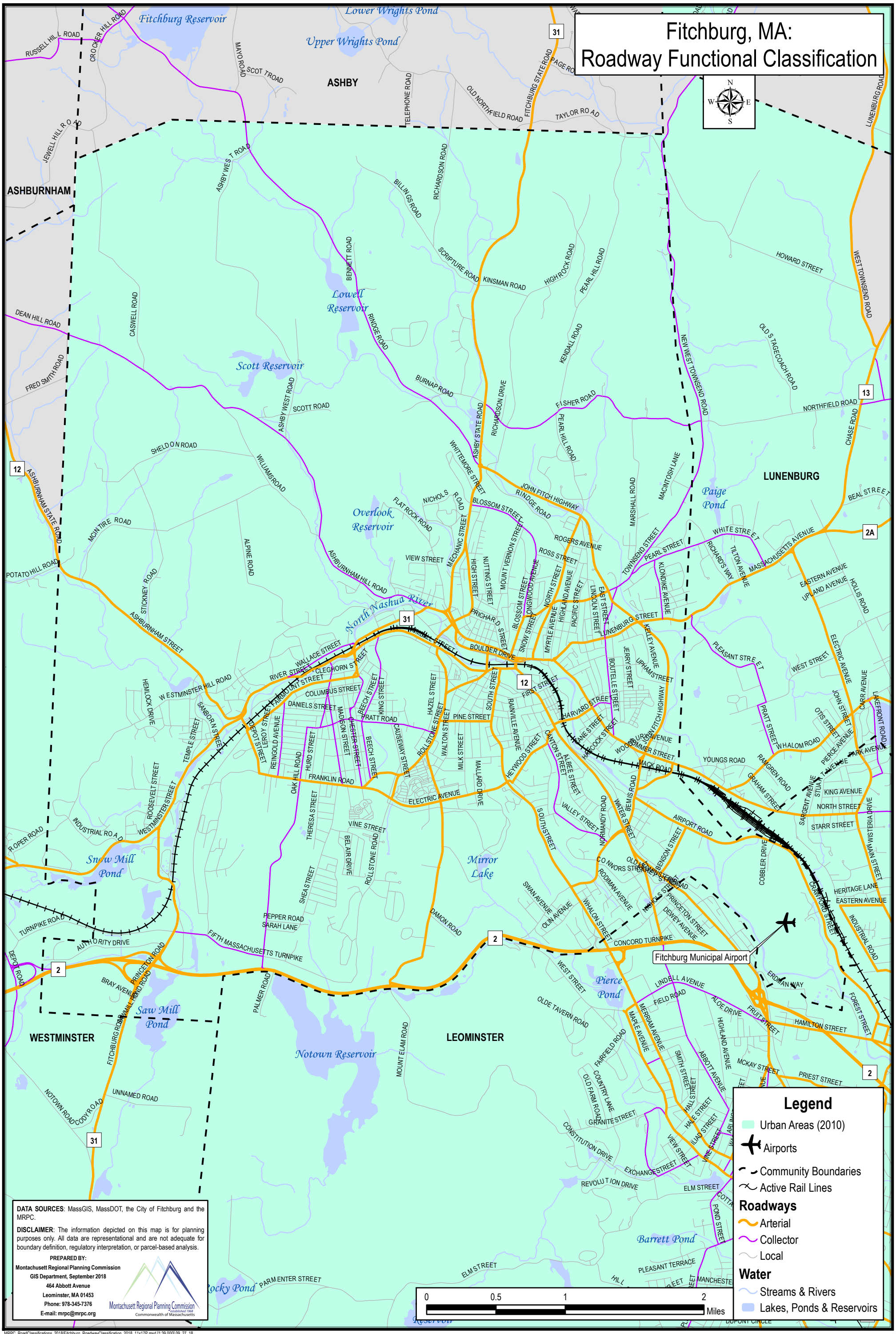
DATA SOURCES: MassGIS, MassDOT, the Town of Clinton and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org
Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

/MRPC_RoadClassifications_2018/Clinton_RoadwayClassification_2018_11x17L.mxd [1:22,000] 09_26_18

Fitchburg, MA:
Roadway Functional Classification



DATA SOURCES: MassGIS, MassDOT, the City of Fitchburg and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

Legend

- Urban Areas (2010)
- Airports
- Community Boundaries
- Active Rail Lines

Roadways

- Arterial
- Collector
- Local

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

MRPC_RoadClassifications_2018/Fitchburg_RoadwayClassification_2018_11x17P.mxd [1:39,000] 09_27_18

Gardner, MA:
Roadway Functional Classification

N
W E
S

DATA SOURCES: MassGIS, MassDOT, the City of Gardner and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

Legend

- Urban Areas (2010)
- Airports
- Community Boundaries
- Active Rail Lines

Roadways
- Arterial
- Collector
- Local

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

0 0.5 1 2 Miles

/MRPC_RoadClassifications_2018/Gardner_RoadwayClassification_2018_11x17P.mxd [1:41,000] 09_27_18

Leominster, MA:
Roadway Functional Classification

FITCHBURG
WESTMINSTER
PRINCETON
STERLING
LUNENBURG
LANCASTER
SHIRLEY

Fitchburg Municipal Airport

Snow Mill Pond
Saw Mill Pond
Notown Reservoir
Wyman Pond
Crow Hills Pond
Rocky Pond
Wachusett Lake
Pierce Pond
Vashua River
Whalom Lake
Massapoag Pond
Lake Shirley
Turner Pond
Fort Pond
Little Spectacle Pond
Spectacle Pond
White Pond
Barrett Pond
Morse Reservoir
Haynes Reservoir
Bartlett Pond
Fall Brook Reservoir
Lake Samoset
Stuart Pond
Hy-Crest Pond
Heywood Reservoir
North Nashua River

PRATT ROAD
PINE STREET
FRANKLIN ROAD
OAK HILL ROAD
MADISON STREET
BEECH STREET
CLARENDON STREET
ROLLSTONE STREET
MOUNT ELAM ROAD
MILK STREET
HEYWOOD STREET
ALBEE STREET
WATER STREET
JOHN FITCH HIGHWAY
SUMMER STREET
YOUNGS ROAD
WHALOM ROAD
PIERCE AVENUE
WILDER ROAD
KING AVENUE
NORTH STREET
STARR STREET
FISH STREET
LEOMINSTER ROAD
KILBURN STREET
RESERVOIR ROAD
FLAT HILL ROAD
BURRAGE STREET
LANCASTER AVENUE
AUTUMN ROAD
GOODRICH STREET
SUNSET LANE
LINDA STREET
JUDY DRIVE
JOSLIN STREET
DAYS STREET
PIERCE STREET
ROUND STREET
LEOMINSTER SHIRLEY ROAD
PIONEER ROAD
FORT POND ROAD
GRANT WAY
SHEA STREET
THERESA STREET
PARKER STREET
ROLLSTONE ROAD
SOUTH STREET
CANTON STREET
CONNORS STREET
BENSON STREET
WANOOSNOC ROAD
RODIMAN AVENUE
OLIN AVENUE
WHALON STREET
PRINCETON STREET
NORTH MAIN STREET
T STREET
HERITAGE LANE
MAIN STREET
LINCOLN STREET
INDUSTRIAL ROAD
TOLMAN AVENUE
DAMON ROAD
CONCORD TURNPIKE
WEST STREET
LINDELL AVENUE
ERDMAN WAY
FOREST STREET
RIVER STREET
HAMILTON STREET
BURRAGE AVENUE
PRIEST STREET
PROSPECT STREET
SCENIC DRIVE
HARVARD STREET
DUVAL ROAD
MILL STREET
WALNUT STREET
WATER STREET
SPRUCE STREET
ADAMS STREET
MIDDLE STREET
SIXTH STREET
EIGHTH STREET
LEOMINSTER CONNECTOR
MECHANIC STREET
FLORENCE STREET
JOHNSON STREET
VISCOLOID AVENUE
LINCOLN TERRACE
LANCASTER STREET
CENTRAL STREET
WHITE POND ROAD
NEW LANCASTER ROAD
OLD MILL ROAD
MAIN STREET
JUNGLE ROAD
LEGATE HILL ROAD
JYTEK DRIVE
OVERLOOK DRIVE
WILLARD STREET
DE. B BIE DRIVE
BETH AVENUE
GRANT STREET
LYNNHAVEN ROAD
LITCHFIELD STREET
DUGGAN DRIVE
BIRCH CROFT ROAD
LONG HILL DRIVE
UNION STREET
WACHUSETT STREET
PETERSON ROAD
MAY STREET
HOBBS ROAD
LUCAS ROAD
HASTING ROAD
JUSTICE HILL ROAD
HAPGOOD ROAD
UPPER NORTH ROW ROAD
NORTH ROW ROAD
HEYWOOD ROAD
ELM STREET
HILL STREET
LOWE STREET
MANCHESTER STREET
TISDALE STREET
PLEASANT STREET
REGINA DRIVE
PARMENTER STREET
ROCKY POND ROAD
LAUREL LANE
WORCESTER ROAD
AUTHORITY DRIVE
DEPOT ROAD
TURNPIKE ROAD
WILLARD ROAD
FIFTH MASSACHUSETTS TURNPIKE
PEPPER ROAD
PALMER ROAD
FITCHBURG ROAD
NARROWS ROAD
EAST ROAD
NOTOWN ROAD
COUNTRY LANE
GRANITE STREET
EXCHANGE STREET
POND STREET
HIGHLAND AVENUE
ABBOTT AVENUE
HALL STREET
BLOSSOM STREET
WASHINGTON STREET
GROVE AVENUE
MERRIAM AVENUE

12
13
2
2A
31
117
190
70

Legend

- Urban Areas (2010)
- Airports
- Community Boundaries
- Active Rail Lines

Roadways

- Interstate
- Arterial
- Collector
- Local

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

0 0.5 1 2 Miles

DATA SOURCES: MassGIS, MassDOT, the City of Leominster and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

/MRPC_RoadClassifications_2018/Leominster_RoadwayClassification_2018_11x17L.mxd [1:45,000] 09_27_18

Montachusett Regional Planning Commission: National Bridge Inventory Structurally Deficient Bridges - 2019

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
LITTLETON
HARVARD
BOXBOROUGH
ACTON
HUBBARDSTON
LANCASTER
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
CLINTON
HUDSON
Quabbin Reservoir
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
NORTHBOROUGH
WARE
PAXTON

Legend

- Community Boundaries
- Active Rail Lines

National Bridge Inventory

- Structurally Deficient

Roadways

- Interstate Routes
- US & State Routes
- Other Roadways

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

0 2.5 5 10 Miles

DATA SOURCES: MassGIS, MassDOT and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, May 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

/MRPC_Bridges_2019/MRPC_Bridges_2019_11x17L.mxd [1:190,000] 06_05_19

Montachusett Regional Planning Commission:
Federal Aid Routes Surveyed by MassDOT & MRPC - 2019

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
ROYALSTON
WARWICK
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
GROTON
WESTFORD
ATHOL
GARDNER
FITCHBURG
LUNENBURG
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
LITTLETON
HARVARD
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
MARLE
OAKHAM
NORTHBOROUGH
WARE
PAXTON

Legend

- Community Boundaries

Pavement Condition

- Poor
- Fair
- Good
- Excellent

Roadways

- Interstate
- US & State Routes
- Other Roadways

DATA SOURCES: MassGIS, MassDOT and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, May 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

0 2.5 5 10 Miles

/MRPC_PavementSurveys/MRPC_PavementConditions_2019_11x17L.mxd [1:190,000] 05_10_19

Bikeway Projects in the Montachusett Region

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
PHILLIPSTON
TEMPLETON
Gardner Municipal Airport
WESTMINSTER
LEOMINSTER
Fitchburg Municipal Airport
SHIRLEY
AYER
LITTLETON
HARVARD
BOXBOROUGH
ACTON
HUBBARDSTON
LANCASTER
NEW SALEM
PETERSHAM
PRINCETON
STERLING
Sterling Airport
BOLTON
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
MARLBOROUGH
NORTHBOROUGH
OAKHAM
WARE
PAXTON
NEW BRAINTREE

DATA SOURCES: MassGIS, MassDOT and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

Legend

- Airports
- Community Boundaries
- Active Rail Lines

Bikeway Projects

- Ashburnham Rail Trail
- Mass Central Rail Trail
- Nashua River Rail Trail
- North Central Pathway
- Squannacook River Rail Trail
- Twin City Rail Trail

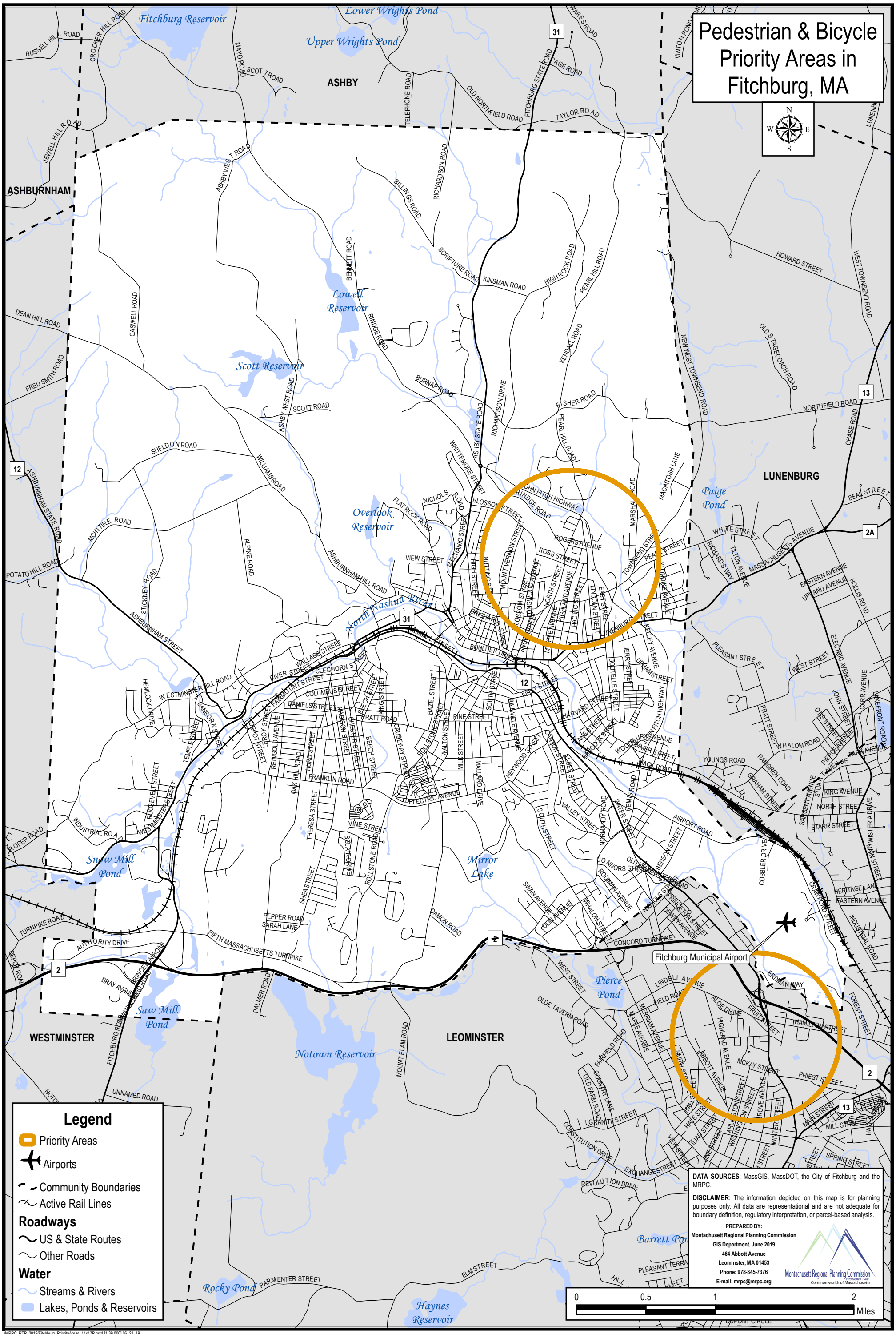
Roadways

- Interstate Routes
- US & State Routes

0 2.5 5 10 Miles

/MRPC_RTP_2019/MRPC_Region_BikewayProjects_11x17L.mxd [1:190,000] 06_21_19

Pedestrian & Bicycle Priority Areas in Fitchburg, MA



Legend

- Priority Areas
- Airports
- Community Boundaries
- Active Rail Lines

Roadways

- US & State Routes
- Other Roads

Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, the City of Fitchburg and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 0.5 1 2 Miles

/MRPC_RTP_2019/Fitchburg_PriorityAreas_11x17P.mxd [1:39,000] 06_21_19

Pedestrian & Bicycle Priority Areas in Gardner, MA

N
W E
S

WINCHENDON
ASHBURNHAM
TEMPLETON
HUBBARDSTON
WESTMINSTER

Cheshire Pond
Lake Wampanoag
Cowee Pond
Hickey Pond
Perley Brook Reservoir
Crystal Lake
Parker Pond
Otter River
Dunn Pond
Kendall Pond
Snake Pond
Bents Pond
Greenwood Pond
Partridgeville Pond
Wrights Reservoir
Burnt Mill Pond
Partridge Pond
Upper Reservoir
Waite Pond

Gardner Municipal Airport

TEEL ROAD
BEMIS ROAD
GARDNER ROAD
RAYMOND ROAD
WINCHENDON ROAD
COUGHLIN ROAD
LINCOLN AVENUE
HUNTER AVENUE
PACKARD HILL ROAD
LAKE ROAD
LASHUA ROAD
LILLIAN DRIVE
OLD COUNTY ROAD
BROGAN ROAD
COREY HILL ROAD
CENTER STREET
WILLIAMS ROAD
PLATTS ROAD
SO MAIN STREET
SO MAPLE STREET
TOWN FARM ROAD
MILL GLEN ROAD
RUSSELL FARM ROAD
ELI DRIVE
HOLLY DRIVE
OTTER RIVER ROAD
FERNWOOD DRIVE
LEO DRIVE
CLARK STREET
CROTTY AVENUE
GREEN STREET
STONE STREET
KELTON STREET
RAYMOND STREET
EATON STREET
OLD MATTHEWS ROAD
MURRAY ROAD
PEARL STREET
MATTHEWS STREET
SMITH STREET
MAY STREET
HOSPITAL ROAD
CHAPEL STREET
GARDNER STATE
WILLIS ROAD
BICKFORD HILL ROAD
CATHERINE STREET
RIDGEWOOD LANE
BLANCHARD STREET
CHERRY STREET
CENTRAL STREET
CROSS STREET
CHESTNUT STREET
ELM STREET
SHERMAN STREET
PINE STREET
MAIN ST
PARK STREET
RACETTE AVENUE
ALLEN STREET
ASH STREET
OAK STREET
PELLET STREET
IWAS STREET
PRINCETON STREET
KEYES ROAD
DEPOT ROAD
MAIN STREET
BRIDGE STREET
WEST STREET
PARKER STREET
CHURCH STREET
MORAN STREET
BAKER STREET
NICHOLS STREET
WRIGHT STREET
DUNTON STREET
MAIN STREET
GREENWOOD PLACE
CRAWFORD STREET
CONANT STREET
WEST BROADWAY
FRIDETTE STREET
COURTNAY AVENUE
BARTHEL AVENUE
LEAMY STREET
GARDNER ROAD EAST TEMPLETON
NORTH MAIN STREET
PATRIOTS ROAD
BAKER LANE
COTTAGE LANE
HIGH STREET
AIRPORT ROAD
MANCA DRIVE
SAWYER STREET
MILL STREET
UNION STREET
PROSPECT STREET
CHELSEA STREET
PARTRIDGE STREET
LOVEWELL STREET
TIMPANY BOULEVARD
WHITNEY STREET
ADAMS STREET
EAST BROADWAY
HIGH STREET
LAKEVIEW DRIVE
MINOTT STREET
SAUNDERS STREET
TEMPLE STREET
CANNON STREET
BETTY SPRING ROAD
COLONY ROAD
WEST MAIN STREET
SIMPLEX DRIVE
SUNSET ROAD
SCENIC DRIVE
FENNO DRIVE
STATE ROAD WEST
PARTRIDGEVILLE ROAD
PAIL FACTORY ROAD
SOUTH MAIN STREET
EAST TEMPLETON
HUBBARDSTON ROAD
CROSS ROAD
SHADY LANE
BIRCHES ROAD
PITCHERVILLE ROAD
UNDERWOOD ROAD
MORGAN ROAD
GEORGE LANE
NEWTON ROAD
WESTMINSTER ROAD
STREETER ROAD
KURIKKA ROAD
MINOTT ROAD
PARTRIDGE LANE
ELLIS ROAD
KNOWER ROAD
WHITNEY STREET

140 12 101 68 2A 2

DATA SOURCES: MassGIS, MassDOT, the City of Gardner and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 0.5 1 2 Miles

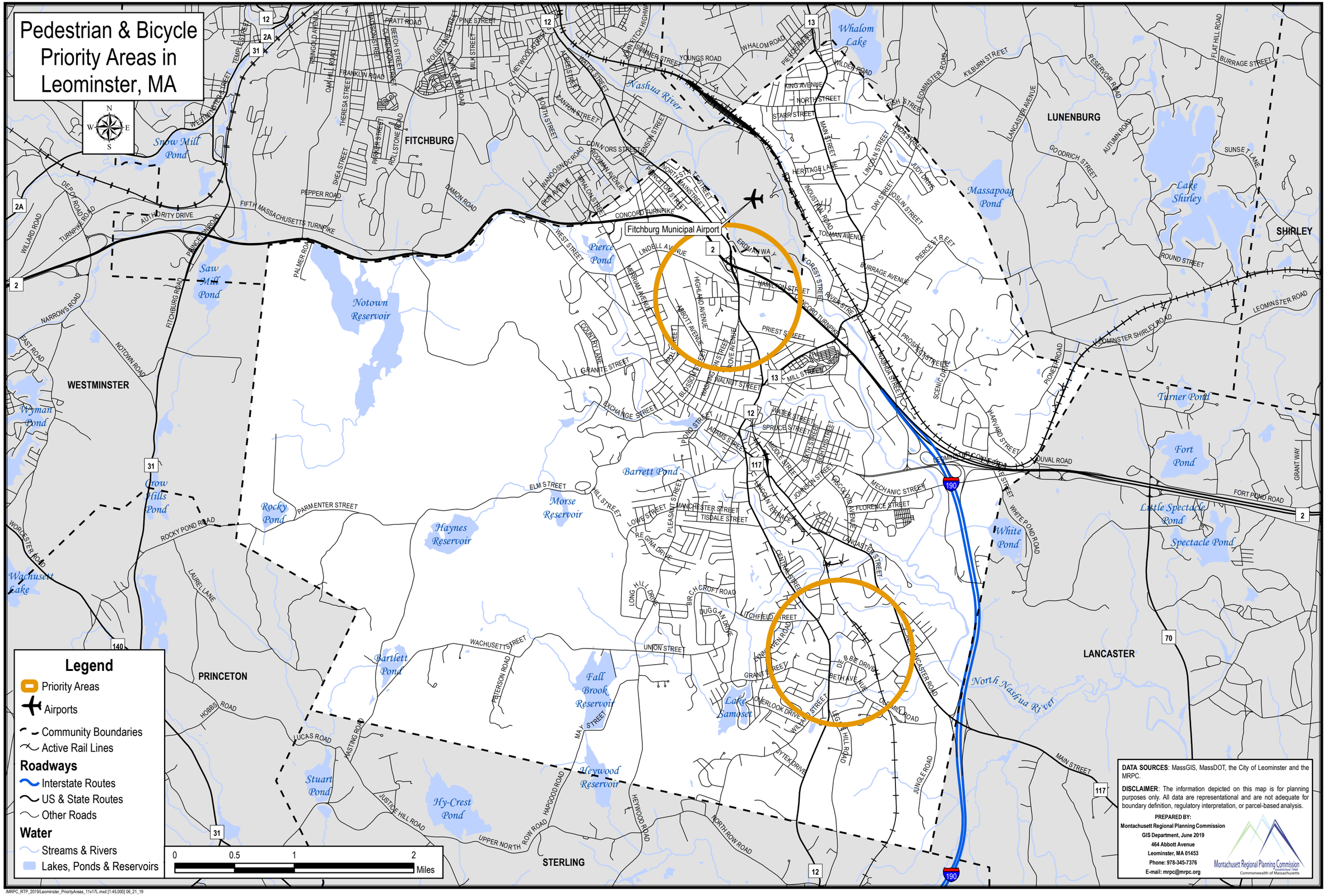
Legend

- Priority Areas
- Airports
- Community Boundaries
- Active Rail Lines

Roadways
- US & State Routes
- Other Roads

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Pedestrian & Bicycle Priority Areas in Leominster, MA



DATA SOURCES: MassGIS, MassDOT, the City of Leominster and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

I:\MRPC_RTP_2019\Leominster_PriorityAreas_11x17L.mxd [1:45,000] 06_21_19

FEMA 100 Year Flood Zones, MA DOT Bridges, and DCR Dams

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
SHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
Gardner Municipal Airport
Fitchburg Municipal Airport
WESTMINSTER
LEOMINSTER
HARVARD
LITTLETON
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
Sterling Airport
CLINTON
BARRE
Quabbin Reservoir
HARDWICK
RUTLAND
WEST BOYLSTON
HOLDEN
BOYLSTON
OAKHAM
NORTHBOR
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, October 2018
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

Legend

- Airports
- Community Boundaries
- Active Rail Lines
- 100 Year Flood Zone

Bridges
- Structurally Deficient

Dams
- High Hazard

Roadways
- Interstate Routes
- US & State Routes
- Other Roadways

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

0 2.5 5 10 Miles

/MRPC_TransportationMisc/MRPC_BridgesAndFloodZones2018_11x17L.mxd [1:190,000] 10_01_18

Montachusett Regional Planning Commission: Communities with Disabled Populations over the Regional Average

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
ROYALSTON
WARWICK
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
PHILLIPSTON
TEMPLETON
WESTMINSTER
SHIRLEY
AYER
LEOMINSTER
LITTLETON
HUBBARDSTON
LANCASTER
HARVARD
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
MARLB
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Legend

- Community with Disabled Population over the Regional Average
- Community Boundaries

/MRPC_RTP_2019/MRPC_Disabilities_11x17L.mxd [1:190,000] 06_25_19

Montachusett Regional Planning Commission: Communities with Elderly Populations (65+) over the Regional Average

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
LITTLETON
HARVARD
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HARDWICK
RUTLAND
HUDSON
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
MARLBOROUGH
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

N
W
E
S

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
established 1968
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Legend

- Community with Elderly Population over the Regional Average
- Community Boundaries

/MRPC_RTP_2019/MRPC_Elderly_11x17L.mxd [1:190,000] 06_25_19

Montachusett Regional Planning Commission: Communities with Foreign-Born Populations over the Regional Average

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
PHILLIPSTON
TEMPLETON
WESTMINSTER
SHIRLEY
AYER
LITTLETON
LEOMINSTER
HARVARD
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Legend

- Community with Foreign-Born Population over the Regional Average
- Community Boundaries

/MRPC_RTP_2019/MRPC_Foreign_11x17L.mxd [1:190,000] 06_25_19

Montachusett Regional Planning Commission: Communities with Limited English-Proficiency Populations over the Regional Average

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
ROYALSTON
WARWICK
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
LITTLETON
HARVARD
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Legend

- Community with Limited English-Proficiency Population over the Regional Average
- Community Boundaries

/MRPC_RTP_2019/MRPC_Language_11x17L.mxd [1:190,000] 06_25_19

Montachusett Regional Planning Commission: Communities with Low Income Populations over the Regional Average

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
ROYALSTON
WARWICK
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
LITTLETON
HARVARD
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Legend

- Community with Low Income Population over the Regional Average
- Community Boundaries

/MRPC_RTP_2019/MRPC_LowIncome_11x17L.mxd [1:190,000] 06_25_19

Montachusett Regional Planning Commission: Communities with Minority Populations over the Regional Average

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
PHILLIPSTON
TEMPLETON
GARDNER
WESTMINSTER
FITCHBURG
LUNENBURG
GROTON
SHIRLEY
AYER
WESTFORD
LEOMINSTER
HARVARD
LITTLETON
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
BOLTON
STOW
BARRE
CLINTON
HUDSON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
NORTHBOROUGH
OAKHAM
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, June 2019
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1968
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Legend

- Community with Minority Population over the Regional Average
- Community Boundaries

/MRPC_RTP_2019/MRPC_Minority_11x17L.mxd [1:190,000] 06_25_19

Appendix 3- Draft Comment & Responses

	Comment	Response
MassDOT Office of Transportatin Planning	Page 3: Within the table entitled, "Regional Transportation Plan Goals, Objectives and Performance Measures Summary," please more explicitly connect the performance measures to their corresponding objectives.	The Performance Measure Dashboard, previously provided in the Appendix, is now incorporated into this chapter. The dashboard ties each PM with a specific Goal and corresponding objectives.
	Page 14: Please directly state the performance targets that the Montachusett Regional Transit Authority (MART) established within their Transit Asset Management (TAM) Plan	TAM performance targets have been included in this chapter
	Throughout this chapter, please revise references to the Surface Transportation Program (STP) to the Surface Transportation Block Grant (STBG)	References updated and corrected as noted.
	Page 4: Within Table 4 - 5, "Title VI and Environmental Justice Populations," please address or add a footnote describing why the fields for the total population and percent of population classified as Environmental Justice based on income are currently listed as "N/A."	Due to the different criteria used for the FTA and FHWA Low Income definitions, a specific population count cannot be calculated. The FTA definition is based on a regional average and FHWA is based on the statewide median income.
	Page 61: Please reference the level of investment that is required to meet the recommendation of maintaining a state of good repair.	Overall Increase in Level of Investment: Network conditions over the last four years show an increase in percentage of roads in "poor" condition and decrease in percentage of "excellent" condition. This indicates that the current funding level of road maintenance projects is inadequate to keep up with the rate of deterioration. An overall increase in pavement repair projects along with investing in roads before they require full depth reconstruction is recommended. Furthermore, conditions should be closely monitored due to the threat of a deteriorating network.
	Within the safety section of this chapter, please provide the source of the data that is depicted in the graphs throughout this section and reference the previously discussed performance measures.	Staff will provide the data source of the graphs and reference the previously discussed safety PM.
	Pages 75-77: To the extent possible, please provide details on where there have been road safety audits and/or initiated projects among the listed high crash locations identified.	Staff will provide details on where there have been RSAs, completed projects and initiated projects among the identified high crash locations.
	Within the bicycle and pedestrian section, please reference the upcoming regional bicycle and pedestrian plans programed in the FFY 2020 Montachusett Unified Planning Work Program and describe how these plans will address the priority areas and recommendations identified within this chapter.	The UPWP tasks were referenced and included in the recommendations listed within the RTP.
	Page 83: Please indicate that a MassTrails grant was awarded in June 2019 to support the construction of the Squannacook River Rail Trail.	We included all five communities that received funding and specified the Squannacook River Rail Trail in the trail project section.
	Page 93: In addition to listing critical rural and urban freight corridors, please explain the purpose and implications of these designations.	Staff will explain the purpose and implications of the critical urban and rural freight corridors.
	To the extent possible, please provide responses to the public comments that were received through the online comment application, survey, and at the RTP public meetings, referencing ongoing planning efforts or projects that address these comments.	Where applicable, a table will be added that outlines a response for the individual or grouped comments received. These responses will outline expected planning activities (past or future work tasks in the Montachusett Unified Planning Work Program) and/or applicable projects (identified from this RTP or the Transportation Improvement Program) that are likely to address the comment.
	In addition to the equity analysis that is provided regarding the distribution of Transportation Improvement Program (TIP) projects, please describe how equity considerations were accounted for when developing the scenarios and recommendations contained within this RTP.	The following will be added to the Equity chapter stating: "Recommendations developed were not targeted specifically for EJ/Title VI populations but rather based upon the comments received and the trends and deficiencies identified throughout the RTP development process….The goal to improve the efficiency, reliability and accessibility of the various transportation networks in the Montachusett region benefits all populations but will likely have more of an impact to the key equity populations."
	Please describe what action items are needed to implement each recommendation listed within this chapter and to what extent ongoing planning efforts are currently addressing them.	Information will be added to each recommendation in this chapter identifying "Action Items" that will address the recommendations. This will include future planning activities and/or tasks as well as projects that need to be implemented.

MassDOT Office of Transportatin Planning	Please more explicitly describe how the demographic projections and the regional vision informed the scenarios that were developed.	Additional wording will be added that highlights how the demographic projections impact or effect the scenarios developed. As an example, the expected slowdown in population, employment and household growth, will need to be addressed by communities as they determine how to best provide access to basic necessities for their residents. Do municipalities want to stay within their boundaries and provide more opportunities for residents by improved local mobility (Scenario 3 Strong Community Centers) or do they take advantage of established commercial and employment districts in the region by improved long distance mobility (Scenario 2 Multiple Hubs)?
	Please ensure that the final document contains the results of the greenhouse gas modeling currently underway.	Up to date modeling has been added to this chapter.
	Page 6: Please remove Table 10-3, "Fiscal Analysis Federal Bridge Funds for Montachusett Region vs Regional Needs," as bridge funding is determined at the discretion of MassDOT's Bridge Section.	Table will be removed and wording changed to reflect MassDOT bridge funding discretion.
	Page 16: The fiscal constraint analysis should be performed using only MPO target/discretionary funding as an assumed source of revenue. As such, please revise the "available funding less estimated needs" line within the fiscal constraint analysis to reflect this.	This table will be revised and corrected as indicated in the comment. Appropriate wording will be included as needed.
	Pages 21 - 27: Please add the Route 2 Interchange at South Athol Road to the financial analysis for each identified scenario to indicate the amount of funding available within each identified program after this project is accounted for.	All tables will be revised to identify the Major Infrastructure Project on Route 2 at South Athol Road for the various planning scenarios as requested.
Peter Sutton, MassDOT Bicycle and Pedestrian Coordinator	"Just gave the RTP bike/ped section a quick review and am impressed by the extensive info regarding trail development. Also glad to see both MassDOT bike and ped plans referenced as well as the municipal resource guides. Feel free to hyperlink all of them in the final version of the plan. "	Hyperlinks were included in the final version
	MassTrails grants should definitely be added as a funding source under Resources and Funding. Earlier this morning, announcements were made on the first round of grant recipients, with five within MRPC's region: Athol, Fitchburg, Groton, Lunenburg & Townsend.	Included MassTrails Grant under funding sources and mentioned the five communities that received MassTrails Funding in 2019 (see response above)
Rosemarie Meisner, Ashburnham	In regards to the Ashburnham Rail Trail - One word needs to be changed. Change "keep" to "deem".	Correction made.
Brian Cline, Sterling & MRTC	General overview of the Mass Central Rail Trail - write up suggestions	Comment was noted and incorporated where appropriate.

Neil Angus, Environmental Planner, Devens Enterprise Commission (Received after the close of comment period but included as reference)	Devens is a Census-designated-place and has its own statistics: https://datausa.io/profile/geo/devens-ma/#housing I believe this data is separate from Ayer Harvard and Shirley so should Devens be included in all the report tables where applicable? It was included in the 2015 Plan but not consistently throughout the plan. Including Devens as a specific entity may help to more accurately represent conditions within the region. While the Devens Regional Enterprise Zone ("Devens") is not an actual municipality, MassDevelopment and the Devens Enterprise Commission are considered a municipality, municipal agent, or unit of local government under Chapter 498. Devens could be included in this table and the RTP as a whole with an asterisk/note explaining that it is a Regional Enterprise Zone and an Economic Target Area and an Economic opportunity Area within the region.	Comment provided after closed comment period and the July 17, 2019 MPO meeting. Comments will be noted and where possible, information related to Devens and their plans will be reviewed as the MRPC "Moves Forward". In particular the planned regional bicycle and pedestrian plans will take into account Devens and its various networks.
	Devens is home to an intermodal rail facility that services a large portion of the over 100 businesses and industries that are located within Devens. This has a huge impact on economic vitality and transportation in the region and might be worth noting.	
	The Devens Shuttle service (provided by MART) helps connect Devens residents and its over 5,500 employees with Ayer, Shirley, Leominster and Fitchburg and the entire MART system.	
	The Devens Open Space and Recreation Plan and Main Post Trail Master Plan and Complete Streets Policy are facilitating bicycle, pedestrian and trail connections within the region – improving safety, connectivity and accessibility within the region – specifically in Ayer, Harvard and Shirley.	
	Environment and Climate Change: Devens redevelopment is guided by MGL Chapter 498 of the Acts of 1993 and the Devens Reuse Plan and sustainable redevelopment is a guiding principle. Our redevelopment efforts align very well with the 7 goals of the RTP. Redevelopment within Devens helps to promote concentrated development in previously serviced/disturbed areas (brownfield redevelopment) and our Greenhouse Gas Inventory and Climate Action Plan (currently underway) will contribute greatly to GHG reduction targets, as well as health and safety goals in the Montachusett Region.	