

FFY 2021 – 2025 TRANSPORTATION IMPROVEMENT PROGRAM



MONTACHUSETT METROPOLITAN PLANNING ORGANIZATION

MPO ENDORSED MAY 20, 2020

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Prepared in cooperation with the Massachusetts Department of Transportation and the U.S. Department of Transportation. The views and opinions of the Montachusett Regional Planning Commission expressed herein do not necessarily state or reflect those of the Massachusetts Department of Transportation or the U.S. Department of Transportation.

The Montachusett MPO and the MRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. The Montachusett MPO operates without regard to race, color, national origin, English Proficiency, ancestry, creed, income, gender, age and/or disability. Any person who believes him/herself or any specific class of persons, to be subject to discrimination prohibited by Title VI may by him/herself or by representative file a written complaint with the MRPC or the MMPO. Complaints are to be filed no later than 180 days from the date of the alleged discrimination. Please contact Glenn Eaton at 978-345-7376 ext. 310 for more information.

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MONTACHUSETT

REGIONAL PLANNING COMMISSION

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



MONTACHUSETT METROPOLITAN PLANNING ORGANIZATION ENDORSEMENT OF THE 2021 – 2025 TRANSPORTATION IMPROVEMENT PROGRAM

Whereas, the Montachusett Metropolitan Planning Organization (MMPO) has completed its review in accordance with 23 CFR Part 450 Section 324 (Development and content of the Metropolitan Transportation Plan) and 23 CFR Part 450 Section 326 (Transportation Improvement Program: General) and hereby certifies that the FFY 2021-2025 TIP is financially constrained and that it conforms to the Montachusett 2020-2040 Regional Transportation Plan. Based on the results of the review and analyses, the Montachusett 2020-2040 Regional Transportation Plan and FFY 2021-2025 TIP are consistent with the air quality goals of, and in conformity with, the Massachusetts State Implementation Plan;

Therefore, the Committee of Signatories representing the Montachusett Metropolitan Planning Organization (MMPO) by a majority vote hereby endorses the Montachusett Region FFY 2021-2025 Transportation Improvement Program (TIP).

*Note: Signed Endorsement Page on File with the
Montachusett Regional Planning Commission*

*Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation*

*Jonathan Gulliver, Administrator
Massachusetts Department of Transportation, Highway Division*

*Guy Corbosiero, Chairman
Montachusett Regional Planning Commission*

*Dean Mazzarella, Mayor, Chairman/Mayor
Montachusett Regional Transit Authority/City of Leominster*

*Elizabeth Kazinkas, Acting 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*

May 20, 2020

Date

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Certification of the Montachusett Region MPO Transportation Planning Process

The Montachusett Region Metropolitan Planning Organization certifies that its conduct of the metropolitan transportation planning process complies with all applicable requirements, which are listed below, and that this process includes activities to support the development and implementation of the Regional Long-Range Transportation Plan and Air Quality Conformity Determination, the Transportation Improvement Program and Air Quality Conformity Determination, and the Unified Planning Work Program.

1. 23 USC 134, 49 USC 5303, and this subpart.
2. Sections 174 and 176 (c) and (d) of the Clean Air Act, as amended (42 USC 7504, 7506 (c) and (d) and 40 CFR Part 93 regarding conformity in the Waltham carbon monoxide maintenance area and for applicable State Implementation Plan projects.
3. Title VI of the Civil Rights Act of 1964, as amended (42 USC 2000d-1) and 49 CFR Part 21.
4. 49 USC 5332, prohibiting discrimination on the basis of race, color, creed, national origin, sex, or age in employment or business opportunity.
5. Section 1101(b) of the Fast Act (Pub. L. 114-94) and 49 CFR Part 26 regarding the involvement of disadvantaged business enterprises in U.S. DOT-funded projects.
6. The provisions of the Americans with Disabilities Act of 1990 (42 USC 12101 et seq.) and 49 CFR Parts 27, 37, and 38.
7. The Older Americans Act, as amended (42 USC 6101), prohibiting discrimination on the basis of age in programs or activities receiving federal financial assistance.
8. Section 324 of Title 23 USC regarding the prohibition of discrimination based on gender.
9. Section 504 of the Rehabilitation Act of 1973 (29 USC 794) and 49 CFR Part 27 regarding discrimination against individuals with disabilities.
10. Anti-lobbying restrictions found in 49 USC Part 20. No appropriated funds may be expended by a recipient to influence or attempt to influence an officer or employee of any agency, or a member of Congress, in connection with the awarding of any federal contract.

The Committee of Signatories representing the Montachusett Metropolitan Planning Organization (MMPO) by a majority vote hereby endorses the Self Certification Compliance Statement for the Montachusett MPO.

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the Montachusett Regional Planning
Commission*

*Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation*

*Jonathan Gulliver, Administrator
Massachusetts Department of Transportation, Highway
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Certification of the Montachusett Region MPO Transportation Planning Process 310 CMR 60.05: Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation



This will certify that the FFY 2021-2025 Transportation Improvement Program 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.

*Stephanie Pollack, Secretary and CEO
Massachusetts Department of Transportation*

*Jonathan Gulliver, Administrator
Massachusetts Department of Transportation, Highway
Division*

*Guy Corbosiero, Chairman
Montachusett Regional Planning Commission*

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

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Montachusett Regional Planning Commission**

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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 administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of age, sex, and disability. These protected categories are contemplated within 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 coordinador 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.

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MONTACHUSETT METROPOLITAN PLANNING ORGANIZATION SIGNATORIES

Massachusetts Department of Transportation (MassDOT) Secretary
 MassDOT Highway Division Administrator
 Montachusett Regional Planning Commission (MRPC) Chairman
 Montachusett Regional Transit Authority (MART) Chairman and
 Mayor City of Leominster
 Mayor City of Gardner
 Mayor City of Fitchburg
 Winchendon Board of Selectmen *Subregion 1*
 Ashburnham Board of Selectmen *Subregion 2*
 Lunenburg Board of Selectmen *Subregion 3*
 Lancaster Board of Selectmen *Subregion 4*

Stephanie Pollack
 Jonathan L. Gulliver.
 Guy Corbosiero
 Mayor Dean Mazzarella

 Acting Mayor Elizabeth Kazinkas
 Mayor Stephen DiNatale
 Barbara Anderson
 Rosemarie Meissner
 Phyllis Luck
 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 Corbosiero
 Mohammed H. Khan, Administrator, MART, for Chairman Mayor Dean Mazzarella

EXOFFICIO MEMBERS

Jeffrey H. McEwen, Administrator
 Peter Butler, Acting Regional Administrator

Federal Highway Administration
 Federal Transit Administration

MONTACHUSETT REGIONAL PLANNING COMMISSION (MRPC) OFFICERS

Guy Corbosiero, Chairman
 John Telepciak, Vice Chairman
 Michael Pineo, Secretary
 Alan Pease, Treasurer
 Roger Hoyt, Asst. Treasurer

Winchendon
 Phillipston
 Sterling
 Ashby
 Ashburnham

MONTACHUSETT JOINT TRANSPORTATION COMMITTEE (MJTC) OFFICERS

Jon Wyman, Chairman
 Paula Bertram, Vice Chairman
 Doug Walsh, Secretary

Westminster
 Lunenburg
 Athol

MONTACHUSETT REGIONAL PLANNING COMMISSION STAFF

Glenn Eaton, Executive Director
 Linda Parmenter, Administrative/Human Resources Director
 Linda Quinlivan, Fiscal Director
 Brad Harris, Transportation Director
 George Snow, Principal Transportation Planner
 Sheri Bean, Principal Planner
 Brian Doherty, Principal Transportation Planner
 George Kahale, Transit Director
 Holly Ford, Executive Assistant

John Hume, Planning & Development Director
 Karen Chapman, Principal Planner
 Jonathan Vos, Regional Planner
 Jason Stanton, GIS/IT Director
 Kayla Kress, GIS Analyst

MONTACHUSETT JOINT TRANSPORTATION COMMITTEE
COMMUNITYAPPOINTED BY SELECTMEN/MAYORAPPOINTED BY PLANNING BOARD

Ashburnham
 Ashby
 Athol
 Ayer
 Clinton
 Fitchburg
 Gardner
 Groton
 Harvard
 Hubbardston
 Lancaster
 Leominster
 Lunenburg
 Petersham
 Phillipston
 Royalston
 Shirley
 Sterling
 Templeton
 Townsend
 Westminster
 Winchendon

Doug Walsh

 Phil Duffy
 Nicolas Bosonetto
 Treavor Beauregard

 Travis Brown

 David DiGiovanni
 Paula Bertram
 Nancy Allen
 Gordon Robertson
 Roland Hamel

 Richard Maki

 Don Klein

 Keith Hickey

Richard Wright
 Alan Pease
 Doug Walsh
 Mark Archambault

 Paula Caron

 Russell Burke
 Erin McBee

 Michael Antonellis
 Peter Latchis

 Bonnie Lawrence

 Charles Carroll II
 Veronica Kell
 Jon Wyman
 Tracy Murphy

EXOFFICIO MEMBERS

Bryan Pounds	Office of Transportation Planning (OTP) and Massachusetts Department of Transportation (MassDOT)
Jeffrey H. McEwen	Federal Highway Administration (FHWA), Administrator
Peter Butler	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
Christopher McDermott	North Central MA Chamber of Commerce
	Fitchburg Council on Aging
Jessica Strunkin	Mass Development
Peter Lowitt	Devens Enterprise Commission (DEC)
Patricia Pistone	Montachusett Opportunity Council, Inc.
	The ARC of Opportunity

INTRODUCTION

This document is the product of a comprehensive, continuing and cooperative effort to improve and sustain the transportation systems of the Montachusett Region. The decisions and priorities established within are derived and shaped through outreach to and input from local officials, the Montachusett Joint Transportation Committee (MJTC), the Montachusett Regional Transit Authority (MART), the Montachusett Regional Planning Commission (MRPC), the Massachusetts Department of Transportation (MassDOT), the MassDOT Highway Division and any and all interested individuals, organizations and stakeholders in the public at large. Throughout the development and decision-making process, all individuals in the Region are strongly encouraged to participate in the transportation planning process, voice any opinions or concerns and help shape and guide the development of this document.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP) DEVELOPMENT PROCESS

Requirement for Transportation Improvement Program (TIP)

The TIP is required under Federal Regulations issued jointly by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). This TIP is a prioritized listing of transportation projects proposed for implementation for the Montachusett Region during the future five federal fiscal years. This time period is broken down into the coming year (Year 1 Element) and the following four years (Year 2 through Year 5). The TIP projects are also identified by funding category so that where necessary priorities may be established for projects within each funding program. Unless otherwise noted, the agency responsible for advertising highway projects is the Massachusetts Department of Transportation Highway Division and, for transit projects, the Montachusett Regional Transit Authority. The reader will note that some of the same projects may be found again in this year's Year 1 Element because they have been delayed by various problems in their design or environmental requirements, while other projects found in last year's TIP have been removed due to implementation.

Procedures for Development of TIP

The MRPC staff annually develops the TIP project listing. Sources used include the MassDOT's Project Information System, MassDOT Highway Division Districts 2 and 3, local officials, the Montachusett Joint Transportation Committee (MJTC), the Regional Transportation Plan (RTP), the Montachusett Metropolitan Planning Organization (MMPO), regional stakeholders, the general public and Transportation Control Measures (TCMs) identified in the Transportation Element of the State Implementation Plan (TESIP).

The local planning process conforms to the private enterprise requirements of the FTA Act, Section 5309, Section 5303 and Section 5307. Specifically, this is demonstrated in the FTA Section 5307 Urban Area Formula Program. Funding from each of these grants is supplied to private transportation providers who provide, under contract, mass transportation services to the Montachusett Regional Transit Authority and to various communities to through Council on Aging services. The private operators are Management of Transportation Services, Inc., Management of Transportation Services Gardner, Inc., Dial-A-Mart Services, Inc., and Management of Transportation Services Gardner, Athol Division. Input from all the providers is utilized in the planning process.

Public Participation Procedures

The Montachusett Public Participation Program (PPP) establishes the procedures utilized to ensure “opportunities for any and all interested individuals to participate early and often in the transportation decision making process.” The PPP also seeks to outline “the process that the MMPO will use to reach out to persons identified under the regulations/laws of Title VI, Environmental Justice (EJ), Limited English Proficiency (LEP), Americans With Disabilities Act (ADA) and as well as any other traditionally underrepresented population.” The MRPC recently amended the PPP in order to change the length for public review and comment periods for the TIP, the Unified Planning Work Program (UPWP), the Regional Transportation Plan (RTP) and other major transportation related documents from 30 days to 21 days. This change allows for a more consistent review process and schedule while still providing ample opportunity for public involvement. After a 45-day public review and comment period, the amended PPP was endorsed by the MPO on March 15, 2017 and became effective as of this date. The PPP also includes provisions for the MPO to reduce the comment period for required documents to a minimum of 10 days under extraordinary circumstances. The PPP is “considered a living document that will change, grow and adapt in order to help the MMPO sustain its work to engage diverse community members throughout its Region. Therefore, the MMPO will modify its public participation methods and activities over time, based on ideas and feedback from community members and the MMPO’s evaluation of its public participation process and effectiveness.” Future updates and/or revisions will also be undertaken as requirements and/or changes are identified due to the passage of the FAST Act, and any future continuing resolutions or federal authorizing legislation.

In conformance with the amended PPP, the draft TIP is distributed for a 21-day public review and comment period. Following completion of the 21-day review period, any comments or issues received are addressed and reflected in the final TIP. This document is then reviewed by the MJTC/MRPC and MMPO and is recommended for endorsement by the Montachusett Metropolitan Planning Organization (MMPO) at a subsequent MMPO meeting.

The fully endorsed TIP is then distributed to Federal, State and local agencies and groups, including FTA, FHWA, the Environmental Protection Agency (EPA) and the Department of Environmental Protection (DEP), again, in conformance with the PPP.

Throughout the development procedure, the Montachusett Transportation Improvement Program (TIP) is compiled in accordance with Title 23 CFR Section 450.324 and 310 CMR 60.03(6)h that requires that the TIP development provide an adequate opportunity for public review and comment. As such, during the TIP development process, a memo announcing the commencement of the TIP was distributed to members of the MPO outreach list including those identified as serving the Title VI and EJ populations. The memo was also translated into Spanish based on our current LEP (Limited English Proficiency) Plan. These memos identified upcoming times and dates where the TIP was to be discussed. It also invited comments and input from all potentially impacted populations including those of Title VI and EJ. These memos were also published to the MRPC webpage. For a listing of the groups contacted as well as a list of meeting dates, please refer to the Coordination/Consultation Process section later in this document.

The Montachusett Regional Transit Authority, a FTA Section 5307/5310/5339 applicant, has consulted with the Montachusett Regional Planning Commission and concurs that the public involvement process adopted by the MPO for the development of the TIP satisfies the public hearing requirements that pertain to the development of the “Program of Projects” (POP) for regular Section 5307, Urbanized Area Formula Program, grant applications including the provision for public notice and the time established for public review and comment.

For FTA projects that are not routine, i.e. applications that require an environmental assessment or an environmental impact statement, the public involvement provided for herein for the TIP review is not sufficient. Additional public involvement, as presented in the joint FHWA/FTA environmental regulations, 23 CFR part 771 will be required by FTA for grant approval.

Coordination/Consultation Process

During the development process of the TIP, the MRPC coordinates with:

- MassDOT Highway Division Districts 2 and 3;
- MassDOT Office of Transportation Planning;
- Montachusett Regional Transit Authority;
- Montachusett Metropolitan Planning Organization;
- Montachusett Joint Transportation Committee.

In addition to specific meetings scheduled for TIP project and Transportation Evaluation Criteria (TEC) review, public meetings of the MJTC and MRPC provide opportunity for input from the general public and interested groups. Notices related to the TIP development and the public comment periods are disseminated to members of the MRPC Transportation Mailing Matrix in accordance with the Montachusett Public Participation Plan (PPP) (MPO endorsed May 25, 2016 and Amended March 25, 2017).

As part of this outreach process, efforts to ensure meeting the requirements of Environmental Justice and Title VI of the 1964 Civil Rights Act are continually examined. This includes the development of a Limited English Proficiency (LEP) Access Plan (MPO Adopted September 2019), translation of memos and certain documents into other languages (based upon the LEP, this is currently done for Spanish), the availability of translation tools for the MRPC website and the inclusion of advocates for special groups in the MJTC membership. MRPC staff maintains a continual review and update process of electronic contact information, i.e. email addresses, in order to correct issues such as broken or non-existent addresses and personnel changes. This electronic mailing list comprises the major PPP distribution list for transportation issues and notices. The update of this electronic mailing list remains an important aspect of our public participation process.

Members of the outreach list include but are not limited to:

Public/Private Groups - Montachusett Joint Transportation Committee (MJTC) Members; Montachusett Regional Planning Commission (MRPC) Members; Montachusett Metropolitan Planning Organization (MMPO) Members; Mayors; Boards of Selectmen; Planning Departments; Planning Boards; City and Town Clerks; Town Administrators; Police Departments; Fire Departments; Public Work Departments; Conservation Commissions; Congressmen; Senators; State Senators and Representatives ; Local Media; Libraries; Councils on Aging; Private Transportation Providers; Regional Transit Authority; Chambers of Commerce; City Councilors; Environmental Protection Agency; Department of Environmental Management; State and Federal Agencies; Housing Authorities; School Districts; Hospitals and Medical Centers; Trail Advocacy Groups and Organizations; Community Development Corporations; and Emergency Management Agencies and Directors.

Special Interest Groups - Montachusett Opportunity Council; Local Transit Union; Cleghorn Neighborhood Center; Spanish American Center; MA Rehab Commission; Fitchburg Spanish Council; Local Community Development Corporations; Airport Managers; Neighborhood Groups; Community Action Groups

The FFY 2021 – 2025 TIP has been or will be discussed at the following scheduled meetings:

- January 2, 2020 – MRPC Meeting
- January 8, 2020 – MJTC Meeting
- January 15, 2020 – Montachusett MPO Meeting
- February 6, 2020 – MRPC Meeting
- February 11, 2020 – TIP Readiness Day
- February 12, 2020 – MJTC Meeting
- February 19, 2020 – Montachusett MPO Meeting
- March 5, 2020 – MRPC Meeting
- March 11, 2020 – MJTC Meeting
- March 25, 2020 – Montachusett MPO Meeting
- April 2, 2020 – MRPC Meeting
- April 8, 2020 – MJTC Meeting
- April 15, 2020 – Montachusett MPO Meeting
- May 7, 2020 – MRPC Meeting
- May 13, 2020 – MJTC Meeting
- May 20, 2020 – Montachusett MPO Meeting
- June 4, 2020 – MRPC Meeting

Through this extensive mailing and notification process, it is anticipated that local and state agencies and officials, as well as other groups/organizations, will be notified of the TIP development process and further coordination and/or consultation will occur as decisions and documents are prepared. As stated in 23 CFR 450.316 (3) (b) the MPO continues to seek to consult with “agencies and officials responsible for other planning activities within the Metropolitan Planning Area (MPA) that are affected by transportation or coordinate its planning process (to the maximum extent practicable) with such planning activities”.

In addition, notices and information encouraging input to the TIP development process have been placed on the MRPC website. This includes all appropriate meeting dates, memos announcing the start of the comment period and the availability of draft documents as well as the draft document itself. These posting were also made to the website in a Spanish language version. Upon endorsement of the TIP by the MPO, final versions of the TIP as well as a project summary are then made available via the MRPC website. All comments received during the public comment and review period, as well as appropriate responses to them, are detailed in the Appendix Comments and Responses at the end of this document.

Project Selection/Prioritization – Transportation Evaluation Criteria

For the purposes of project selection and programming, any project listed in Year 1-5 of the endorsed TIP will be considered to have the concurrence of the MPO without further action required. Prioritization of projects will have taken place by virtue of placement of a project in Years 1 to 5 of the TIP. Out years may contain unallocated funding amounts based upon anticipated federal aid regional target funds. These yearly listing will be further defined as specific projects in subsequent year TIPs.

Prioritization of projects is based upon input from MassDOT regarding project design and implementation status, local prioritization from chief elected officials, scoring of the project based upon the Transportation Evaluation Criteria (TEC), fiscal constraints for the Montachusett Region, consensus vote by the MJTC and formal adoption by the MPO. Throughout this procedure, input from local citizens are reviewed and considered where appropriate in the prioritization process.

As indicated, an initial project listing is obtained from MassDOT and the local communities. These projects are then reviewed one by one to ascertain their current status as to design and potential advertising dates. Projects are then scored and evaluated utilizing the Transportation Evaluation Criteria (TEC). The TEC is a series of criteria to “be applied by the appropriate implementing agency during the project development stage to ensure that our limited budgetary and staff resources are committed to the best proposals; to assist the MPO process of programming federal funding through the regional Transportation Improvement Programs; and to examine existing projects in the pipeline to determine which should ultimately proceed to design and construction.”

The criteria are used to cover all types of transportation projects from simple resurfacing to reconstruction and expansion. Benefits and impacts are examined for transportation as well as economic development, community effects, environmental justice issues, land use and environmental impacts. Final scores based upon the TEC then become part of the decision and prioritization process.

The Montachusett TEC is based on a scoring scale of 0 to 66 with the higher the score the greater the project priority. To establish the 66-point scale, 26 separate questions were derived and grouped into six (6) categories. The categories and individual questions/criteria per category breakdowns as follows:

Montachusett TEC Category and Scoring Summary

Category	No. of Individual Questions/Criteria	Total Maximum Category Score
Condition	4	14
Mobility	4	10
Safety	4	13
Community Effects and Support	4	13
Land Use and Economic Development	5	11
Environmental Effects	5	5
Totals	26	66

The Maximum Category scores reflect the relative importance of that category as determined by the MPO during the establishment of the Montachusett TEC, i.e. Condition, Safety and Community Effects and Support were deemed to be of greater significance in the prioritization process. For a sample TEC scoring sheet, please refer to the appendix of this document.

At the start of each TIP development cycle, MPO staff reviews the latest information and status of the regions projects in order to update their individual TEC scores. As projects move forward, more details related to their scope, purpose and impacts can usually be derived. This in turn results in a better ability to score the project based on the TEC questions.

After all projects are scored, a prioritized listing is established by the MPO. This listing helps to drive the development of each of the individual federal fiscal years of the TIP. Two additional elements of the project also play into the prioritization process; the projects estimated total cost and its current design status. The current design status of a project significantly affects its potential for advertisement in a particular fiscal year. Delays in permitting, right-of-way, environmental impacts, etc. can prevent a highly-scored project from being included in particular year. Thus, close coordination with MassDOT on project development is an important aspect of developing a workable TIP. In addition, the TIP is required to be fiscally constrained, i.e. a region cannot program more projects than the anticipated federal funds available for its region. MassDOT provides each region with these federal “target” figures to assist in the development of a fiscally constrained document. These fiscal limits can impact how many projects can be allocated in a certain year, thus consensus on cost estimates are also

key in the TIP process. From this, a project listing by fiscal year is developed. The listing is then reviewed by state and local officials, as well as the MJTC and the MPO, to determine fiscal constraint by funding year. Any problems are then identified. Through the MPO, projects are adjusted and prioritized in order to resolve the identified problems.

The following table provides the Montachusett FFY 2021 – 2025 TIP Project Priority Listing based upon their respective TEC scoring.

	MONTACHUSETT MPO FFY 2021-2025 TIP PROJECTS - TEC SCORING PRIORITIZED LISTING																																
				Condition				Mobility				Safety				Community Efts & Spprt				Land Use & Econ Dev					Environmental Effects								
FFY 2021-2025 TIP Year	Project ID #	Community	Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total	Design Status	Est Cost ProjectInfo	
2023-2025	604499	Leominster	Leominster- Resurfacing And Related Work on Rt 12 (Central St)	4	2	4	2	2	2	2	0	3	1	0	0	2	2	1	1	4	1	0	0	3	1	0	0	0	1	38	25%	\$13,283,024	
2023	607432	Westminster	Westminster - Rehabilitation & Box Widening on Rt 140, From Patricia Rd to the Princeton T.L.	4	3	4	1	0	1	0	0	0	2	1	0	1	0	4	3	1	1	1	0	3	0	1	1	0	1	33	75%	\$5,816,581	
2021	607431	Westminster	Westminster - Resurfacing & Related Work on Route 140, From Route 2A to Patricia Road	4	3	2	2	0	1	0	0	0	2	1	0	1	0	4	3	1	1	1	0	3	0	1	1	0	1	32	PS&E	\$1,459,855	
	609213	Harvard	Harvard- Resurfacing and Box Widening on Ayer Road, from Route 2 to the Ayer Town Line	4	3	4	3	0	0	0	0	0	1	1	0	1	1	2	2	2	1	1	1	3	0	1	0	0	1	32	Prelim	\$5,520,000	
2022	608779	Lancaster	Lancaster- Intersection Improvements on Route 117/Route 70 at Lunenburg Road and Route 117/Route 70 at Main Street	2	2	3	2	2	2	0	0	1	1	0	0	0	1	3	3	2	1	1	1	3	0	0	0	0	1	31	25%	\$5,192,173	
	608723	Athol	Athol- Intersection Improvements at Crescent Street and Chestnut Hill Avenue	4	3	2	1	1	1	1	0	0	0	0	0	1	2	1	3	3	1	0	0	3	1	1	0	0	1	30	25%	\$5,215,807	
	608415	Athol	Athol- Intersection Improvements at Route 2A and Brookside Road	4	3	2	1	1	1	1	0	0	0	0	0	1	2	1	3	3	1	0	0	3	1	1	0	0	1	30	Prelim	\$1,544,750	
2021	608548	Winchendon	Winchendon- Improvements & Related Work on Central Street (Route 202), from Front Street to Maple Street (0.5 Miles)	3	1	3	2	0	1	1	0	0	0	0	0	2	1	1	4	3	1	0	0	3	1	0	1	0	1	29	75%	\$4,505,282	
	606640	Ayer	Ayer- Resurfacing & Related Work on Rt 2A (Fitchburg Rd & Park St)	4	3	3	1	0	0	0	1	0	0	0	0	0	2	1	3	1	1	0	0	3	0	1	0	0	1	25	Prelim	\$2,400,000	
2025	609279	Gardner	Gardner- Roundabout Construction at Elm Street, Pearl Street, Central Street and Green Street	4	2	2	0	1	0	1	0	3	1	0	0	1	2	1	1	2	1	0	0	3	0	0	0	0	0	25	25%	\$2,511,127	
2022	608793	Hubbardston	Hubbardston- Highway Reconstruction of Route 68 (Main Street), from 1,000 ft North of Williamsville Road to Elm Street	3	1	4	3	0	0	0	0	0	0	1	0	1	0	2	2	2	1	0	0	3	0	0	1	0	1	25	25%	\$4,328,308	
2025	609244	Ashburnham	Ashburnham- Roadway Rehabilitation on Rt 101	4	2	3	2	0	0	0	0	0	0	0	0	1	0	1	4	1	1	0	0	3	1	1	0	0	1	25	25%	\$5,630,000	
2021	608888	Gardner	Gardner- Reclamation and Related Work on Pearson Boulevard	3	2	2	1	0	0	2	0	0	0	0	0	2	2	1	1	2	1	0	0	3	1	0	1	0	1	25	25%	\$1,264,648	
2023	608784	Templeton	Templeton- Roundabout Construction at The Intersection of Patriots Road, South Main Street, North Main Street and Gardner Road	4	2	4	1	1	0	0	0	0	0	0	0	1	1	2	1	1	1	1	1	3	1	0	0	0	0	25	25%	\$1,653,316	
	609227	Ayer	Ayer- Roadway Rehabilitation on Route 2A/111 (Park Street and Main Street)	4	0	3	0	2	0	1	1	0	0	0	0	1	2	0	3	3	0	0	0	3	0	0	0	0	0	23	Prelim	\$4,800,000	
	608832	Lancaster	Lancaster- Interchange Improvements at Route 2 Exit 34 (Old Union Turnpike)	0	1	4	0	1	1	0	0	1	1	0	0	1	1	1	4	2	1	0	0	3	1	0	0	0	0	23	Prelim	\$6,060,800	
	608177	Ashby	Ashby - Reconstruction of Route 119 (Townsend Road) from Bernhardt Road to Route 31.	4	1	1	2	0	1	0	0	0	0	0	0	0	2	1	1	1	1	0	0	3	0	0	1	1	1	21	Prelim	\$6,727,500	
	608424	Templeton	Templeton- Reconstruction of Route 68, From King Phillip Trail (Route 202) North to the Phillipston Town Line (2.65 Miles)	4	1	3	1	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	3	0	1	0	0	1	18	75%	\$5,967,274	
	608879	Winchendon	Winchendon- Resurfacing & Related Work on Maple Street (Route 202), From Vine Street to Glenallen Street (1.36 Miles)	4	0	1	0	0	0	0	0	0	0	0	0	0	1	0	4	0	1	0	0	3	0	0	0	0	1	15	Prelim	\$1,680,444	
	607604	Sterling/West Boylston	Sterling/West Boylston - Improvements on Route 140 at I-190	3	1	2	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	3	0	0	0	0	0	14	Prelim	\$3,647,110	
2021	608891	Gardner	Gardner- Resurfacing and Rumble Strip Installation on Route 140	2	0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3	0	0	0	0	1	12	75%	\$1,791,202	

AMENDMENT/ADJUSTMENT PROCEDURES

In order to minimize constraints on programming projects, the endorsed TIP will have the provision, as adopted by the MPO, that will allow relatively minor modifications be made to the TIP without formal MPO action. Significant changes will continue to require MPO action through the amendment process.

Minor modifications may include such actions as:

- moving a project in either direction between the sequential years, ex. Years 1 and 2, Years 2 and 3, etc.;
- changes in funding amounts (typically less than 10% of the total cost) or categories within the same fiscal year.

Minor modifications will be accomplished through an agreed-upon administrative action with the approval of the MPO. That action will include approval of the modification by the MPO at a duly constituted meeting and written notification of the MPO members. Under an adjustment, a formal signatory endorsement and a 21-day public review period will not be required.

Significant changes to the TIP include major actions such as:

- the addition or deletion of a Federal Aid project;
- if the design, scope or budget of a project is found to have changed significantly as determined by the MJTC and MPO (typically cost changes of more than 10%);
- moving a project from Non-Federal Aid to one of the Federal Aid funding categories;
- moving a project in either direction between non-sequential fiscal years, ex. from Year 1 of the TIP to Year 3;
- advancing a project from the Appendix project list to either Years 1, 2, 3 or 4.
- advancing a project from the out Year 5 to either Years 1, 2 or 3.

Significant changes to the TIP will require formal endorsement of an amendment. This amendment process will include a 21-day public comment period, or an abbreviated comment period of not less than ten (10) days under what the MPO considers to be extraordinary circumstances, as outlined in the federal planning regulations and the Montachusett Public Participation Program (as endorsed May 25, 2016 and amended on March 15, 2017), approval of the amendment and signatory endorsement by MPO members at a subsequent MPO meeting.

The MPO will review each request change and determine whether the adjustment or amendment procedure is required for the proposed action. Additionally, MassDOT's Statewide Transportation Improvement Program (STIP) procedures offer more detailed examples of what would constitute an amendment or adjustment. When such an action is warranted and it is not clear from the indicators above which action that may be, the STIP procedures will be consulted to determine what action is appropriate.

Highway Project STIP Revision Definitions and Procedures

Type of Revision	Definition	Procedure	Notes
Major Project Cost Change	Increase or decrease of \$500,000 or greater for projects programmed under \$5,000,000 and greater than 10% of the total cost for projects programmed over \$5,000,000.	Amendment	The "increase" or "decrease" in cost is relative to the Total Federal Participating Cost (TFPC) of a project.
Minor Project Cost Change	Increase or decrease of \$499,999 or less for projects programmed under \$5,000,000 and less than 10% of the total cost for projects programmed over \$5,000,000.	Adjustment	See above.
Project Description Change	Change in the description of the project as it is listed in the STIP.	Adjustment or Administrative Modification	Project description changes are treated as administrative modifications for minor changes (e.g. spelling errors, more detailed descriptions, adding mile-markers, etc.).
Major Project Scope Change	A revision to the project scope large enough to necessitate an additional review by MassDOT's Project Review Committee (PRC) – typically accompanied by major project cost change.	Amendment	In some cases, a major scope change will require the initiation of a new project through MassDOT's Project Initiation Form (PIF), and review/approval by PRC. This would require deactivation and removal of the currently programmed project.
Minor Project Scope Change	A minor revision to the project scope that does not significantly alter the original PRC-approved scope of work.	Adjustment	In many cases, changes in this category will also include a minor cost change.
Project Addition	The programming of a new project in any federal fiscal year of the active TIP.	Amendment or Adjustment	Project additions are treated as amendments if the project was not part of any previously approved STIP that has been vetted through the public process.
Project Removal	The removal of a project in any federal fiscal year of the active TIP.	Amendment	Exception: if a project is removed from an active TIP or the STIP due to it being previously advanced/advertised, or is moved to the statewide list from a regional TIP, the action would be considered an adjustment.
Change in Funding Source	A change in the project's funding source, including federal and non-federal sources which fall within the project cost change revisions listed above.	Adjustment	Changes in funding sources for projects are permissible for advertisement purposes if the FHWA Division Office has been consulted.
Change in Additional Information	A change in any item listed in the "Additional Information" column of the STIP not covered in any other item listed here (e.g. earmark details, project proponent, etc.)	Administrative Modification	N/A
Change in Year of Programming	Moving a currently programmed project earlier or later than an originally programmed year.	Amendment	Changes to a project delivery schedule (advancement or delay) requires an amendment for the change in programmed FFY.

Transit Project STIP Revision Definitions and Procedures

Type of Revision	Definition	Procedure	Notes
Major Project Cost Change	Increase or decrease of \$500,000 or greater for projects under \$5,000,000 and greater than 10% of the total cost for projects exceeding \$5,000,000.	Amendment	The "increase" or "decrease" in cost is relative to the combined federal and non-federal aid participating cost of the project.
Minor Project Cost Change	Increase or decrease of \$499,999 or less for projects under \$5,000,000 and less than 10% of the total cost for projects exceeding \$5,000,000.	Adjustment	See above.
Project Description Change	Change in the description of the project as it is listed in the STIP.	Adjustment or Administrative Modification	Project description changes are treated as administrative modifications for minor changes (e.g. spelling errors, more detailed descriptions, etc.).
Major Project Scope Change	A revision to the project scope deemed large enough to require public review and comment (e.g. changing the number of stations)	Amendment	In many cases, changes in this category will also include a major cost change.
Minor Project Scope Change	A minor revision to the project scope that does not significantly alter the original scope of work (e.g. changes to the bus model for vehicle replacement projects).	Adjustment	In many cases, changes in this category will also include a minor cost change.
Project Addition	The programming of a new project in any federal fiscal year of the current TIP.	Amendment or Adjustment	Project additions are treated as amendments if the project was not part of any previously approved STIP that has been vetted through the public process.
Project Removal	The removal of a project in any federal fiscal year of the current TIP.	Amendment	Exception: if a project is removed from a TIP or the STIP due to it being previously advanced/advertised, or is moved to the statewide list from a regional TIP, the action would be considered an adjustment.
Change in Funding Source	Change in the funding source, including federal and non-federal sources that fall within project cost change revisions listed in the first two rows.	Adjustment	Changes in funding sources for projects are permissible for obligation purposes with written notice from the FTA region office.
Change in Year of Programming	Moving a currently programmed project earlier or later than the originally programmed year.	Amendment or Adjustment	Note: Federal funds shall be programmed in the federal fiscal year in which the award will occur. Changes in year of programming are only treated as adjustments if they involve advancing federal funds to align with the year of the grant award.

COORDINATION WITH REGIONAL TRANSPORTATION PLANNING

The 2020 Montachusett Regional Transportation Plan (RTP) was completed and endorsed by the MPO on July 17, 2019. It 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. These goals and objectives are consistent with the long-range land use plan and the social, economic, and environmental policies of the region.

The 2020 RTP serves as a long-term blueprint of the region's transportation system. The current network is compared to the past and envisioned 20 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.

The RTP decisions reflect the federally certified 3C (comprehensive, cooperative and continuing) process, and are based upon Federal, State and local policies, detailed technical analysis, and citizen participation.

Projects in the Fiscal Year 2021-2025 TIP are consistent with the previous as well as the current Regional Transportation Plan for the Montachusett Region as completed in 2003, 2007, 2012, 2016 and 2020. The transit portion of the region's transportation system and its needs is broken down into several components. These include operations of the Regional Transit Authority and its capital funding needs, as well as commuter rail services (from the MBTA) with park-and-ride managed by the RTA.

Recommendations in the Regional Transportation Plan concerning the Transit Authority component of the region's transportation system are drawn directly from transit development studies and other work tasks. Recommendations made to improve the MART transit system include:

- 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 support equipment, ramp 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 individuals with disabilities 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;

Recommendations for funding of the Mobility Assistance Program including the Section 5310 program are also noted in the Regional Transportation Plan. It states that in order to provide increased mobility for Montachusett residents that do not own automobiles or that choose to be less dependent on the automobile; MART will need to continue to develop and implement appropriate and innovative public transit programs. It also states that elderly and disabled services provided by MART and social service agencies should continue to be monitored for coordination of effort. The vehicles that MART is requesting under MAP would be used as replacements to the vehicles operated in the Dial-A-MART, COA, and ADA complementary Paratransit programs. The Dial-A-MART program coordinates transportation services for social service agencies, disability community advocacy organizations, etc. located in the Montachusett Region.

Capital funding needs can be broken down into three categories: vehicles for revenue service, capital equipment purchases, and construction/rehabilitation projects. The Regional Transportation Plan states that 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. Federal Regulations under MAP-21 and the FAST Act also require that federal recipients maintain their federally funded assets in a State of Good Repair under a Transit Asset Management Plan. Vehicle fleets, equipment and facilities will be programmed under the TIP in accordance with meeting the goals established in that plan.

EQUITY DISTRIBUTION ANALYSIS OF TIP PROJECTS

MassDOT and FHWA require MPO's to include a geographic and social equity analysis of past and current TIP projects. This analysis is broken into two parts. The first is an examination of federal target eligible projects contained within this TIP, i.e. FFY 2021-2025. The second involves a five year "look back" at prior TIP projects. For this analysis that would include projects from FFY 2016 to 2020.

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 2014-2018 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.

Source: 2014-2018 ACS 5-Year Estimates

By Block Group

Variable	2014-2018 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: 2014-2018 ACS 5-Year Estimates

By Census Tract

Variable	2014-2018 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.

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 (\$79,835 in 2018);	Statewide Median Income: \$79,835 65% of Median Household Income: \$51,893 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: 11.53% Geography: Block Group
2. Low Income - Percent estimated below poverty level that is higher than the regional average	Regional Average: 11.00% 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: 15.44% Geography: Block Group
2. Individuals with Disabilities – Percent of population with a disability that is higher than the regional average	Regional Average: 12.82% 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: 11.53% Geography: Block Group
4. Foreign Born – Percent of population that is Foreign Born and is higher than the regional average	Regional Average: 8.66% Geography: Census Tract
5. Language – Percent of Population Spoken Language Other than English that is higher than the regional average	Regional Average: 16.13% Geography: Census Tract

FFY 2021-2025 Target Eligible Projects

To assess the possible benefits or burdens of the projects within the FFY 2021-2025 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 22 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.

FFY 2021-2025 Target Eligible Projects

TIP Year	MassDOT ID #	Community	Description	TEC	Est Cost FFY 2020 Dollars
2023-2025	604499	Leominster	Leominster- Resurfacing And Related Work on Rt 12 (Central St)	38	\$13,283,024
2023	607432	Westminster	Westminster - Rehabilitation & Box Widening on Rt 140, From Patricia Rd to the Princeton T.L.	33	\$5,816,581
2021	607431	Westminster	Westminster - Resurfacing & Related Work on Route 140, From Route 2A to Patricia Road	32	\$1,459,855
	609213	Harvard	Harvard- Resurfacing and Box Widening on Ayer Road, from Route 2 to the Ayer Town Line	32	\$5,520,000
2022	608779	Lancaster	Lancaster- Intersection Improvements on Route 117/Route 70 at Lunenburg Road and Route 117/Route 70 at Main Street	31	\$5,192,173
	608723	Athol	Athol- Intersection Improvements at Crescent Street and Chestnut Hill Avenue	30	\$5,215,807
	608415	Athol	Athol- Intersection Improvements at Route 2A and Brookside Road	30	\$1,544,750
2021	608548	Winchendon	Winchendon- Improvements & Related Work on Central Street (Route 202), from Front Street to Maple Street (0.5 Miles)	29	\$4,505,282
	606420	Fitchburg	Fitchburg- Intersection & Signal Improvements @ Rt 2A (Lunenburg St) & John Fitch Highway	28	\$1,800,000
	606640	Ayer	Ayer- Resurfacing & Related Work on Rt 2A (Fitchburg Rd & Park St)	25	\$2,400,000
2025	609279	Gardner	Gardner- Roundabout Construction at Elm Street, Pearl Street, Central Street and Green Street	25	\$2,511,127
2022	608793	Hubbardston	Hubbardston- Highway Reconstruction of Route 68 (Main Street), from 1,000 ft North of Williamsville Road to Elm Street	25	\$4,328,308
2025	609244	Ashburnham	Ashburnham- Roadway Rehabilitation on Rt 101	25	\$5,630,000
2021	608888	Gardner	Gardner- Reclamation and Related Work on Pearson Boulevard	25	\$1,264,648
2023	608784	Templeton	Templeton- Roundabout Construction at The Intersection of Patriots Road, South Main Street, North Main Street and Gardner Road	25	\$1,653,316
	609227	Ayer	Ayer- Roadway Rehabilitation on Route 2A/111 (Park Street and Main Street)	23	\$4,800,000
	608832	Lancaster	Lancaster- Interchange Improvements at Route 2 Exit 34 (Old Union Turnpike)	23	\$6,060,800
	608177	Ashby	Ashby - Reconstruction of Route 119 (Townsend Road) from Bernhardt Road to Route 31.	21	\$6,727,500
	608424	Templeton	Templeton- Reconstruction of Route 68, From King Phillip Trail (Route 202) North to the Phillipston Town Line (2.65 Miles)	18	\$5,967,274
	608879	Winchendon	Winchendon- Resurfacing & Related Work on Maple Street (Route 202), From Vine Street to Glenallen Street (1.36 Miles)	15	\$1,680,444
	607604	Sterling/West Boylston	Sterling/West Boylston - Improvements on Route 140 at I-190	14	\$3,647,110
2021	608891	Gardner	Gardner- Resurfacing and Rumble Strip Installation on Route 140	12	\$1,791,202

FFY 2021-2025 Target Eligible Projects Equity Analysis

An analysis of the geographic distribution of the eleven projects within the 2021-2025 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:

- The total regional population was determined, along with the population of each identified Environmental Justice and Title IV group (Row 1), from which the percentage of total population was determined for each group (Row 2).
- Of the 11 projects analyzed based on EJ and Title VI identified populations, a dollar amount which was spent within each geographic area was determined (Row 3). It was then determined what percent of total funds were spent within each group (Row 4)
- Row 5 displays the comparison of the percentage of total population to the percentage of funding spent.

FFY 2021-2025 TIP Target Eligible Projects Equity Analysis Summary

		Total Regional Population	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	Population	243,637	45,165	28,310	2,578	28,310	23,485	36,946	28,310	28,825	20,519	34,432
2	Percent of Total Regional Population	100.00%	18.54%	11.62%	2.83%*	11.62%	9.99%**	15.16%	11.62%	11.83%	8.42%	14.99%***
3	Total Cost of TIP Projects	\$44,424,034	\$18,850,001	\$1,791,202	\$0	\$15,074,226	\$16,338,874	\$33,250,237	\$15,074,226	\$17,585,353	\$13,283,024	\$18,475,197
4	Percent of Regional Cost of Projects	100%	42.43%	4.03%	0.00%	33.93%	36.78%	74.85%	33.93%	39.59%	29.90%	41.59%
5	Difference in % Cost and % Population	0.00%	23.89%	-7.59%	-2.83%	22.31%	26.79%	59.69%	22.31%	27.76%	21.48%	26.60%

* Percentage of Total Montachusett Region Households (91,165)

** Percentage of Poverty determined Montachusett Population (235,093)

*** Percentage of Montachusett Region Total Population Five Years and Older (229,719)

- An examination of Row 5 shows the majority of identified groups benefit disproportionately in these investments when compared to their overall regional population.
- There were two groups who saw less total percentage cost than percentage population, they are
 - The EJ population of Limited English Proficiency (LEP) per Household, in which there is only one such Block Group regionwide
 - The EJ population of Minority, which saw only a difference in investments compared to population (-7.59%).

2016-2020 Projects Five Year Lookback

The following table identifies 11 projects for the Montachusett Region implemented in the last five years, i.e. from FFY 2016 to FFY 2020. All projects appeared in a prior TIP and were advertised for construction, initiated construction or completed construction prior to the development of this TIP.

FFY 2016-2020 TIP Five Year Look Back Projects

TIP Year	MassDOT ID #	Community	Description	Est Cost
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	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
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
2020	605651	Leominster	Reconstruction on Route 13, From Hawes Street to Prospect Street	\$5,994,626
2020	607902	Ayer	Reclamation & Related Work on Route 2A, From Harvard Road to Main Street	\$3,837,875
				\$42,874,486

2016-2020 Projects Five Year Lookback Equity Analysis

An examination of projects funded over the last five TIPs, identified 11 individual projects with an estimated total cost of \$42,847,486. As with the current Target Projects, a geographic distribution of these 11 projects against those areas categorized as Environmental Justice (EJ) or Title VI areas resulted in the following:

- The total regional population was determined, along with the population of each identified Environmental Justice and Title IV group (Row 1), from which the percentage of total population was determined for each group (Row 2).
- Of the 11 projects analyzed based on EJ and Title VI identified populations, a dollar amount which was spent within each geographic area was determined (Row 3). It was then determined what percent of total funds were spent within each group (Row 4)
- Row 5 displays the comparison of the percentage of total population to the percentage of funding spent.

FFY 2016-2020 TIP Five Year Look Back Projects Equity Analysis Summary

		Total Regional Population	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	Population	243,637	45,165	28,310	2,578	28,310	23,485	36,946	28,310	28,825	20,519	34,432
2	Percent of Total Regional Population	100.00%	18.54%	11.62%	2.83%*	11.62%	9.99%**	15.16%	11.62%	11.83%	8.42%	14.99%***
3	Total Cost of TIP Projects	\$42,874,486	\$21,252,862	\$25,547,803	\$0	\$39,506,988	\$42,874,486	\$20,127,877	\$28,477,118	\$18,067,610	\$28,477,118	\$24,639,243
4	Percent of Regional Cost of Projects	100%	49.57%	59.59%	0.00%	92.15%	100.00%	46.95%	66.42%	42.14%	66.42%	57.47%
5	Difference in % Cost and % Population	0.00%	31.03%	47.97%	-2.83%	80.53%	90.01%	31.79%	54.80%	30.31%	58.00%	42.48%

* Percentage of Total Montachusett Region Households (91,165)

** Percentage of Poverty determined Montachusett Population (235,093)

*** Percentage of Montachusett Region Total Population Five Years and Older (229,719)

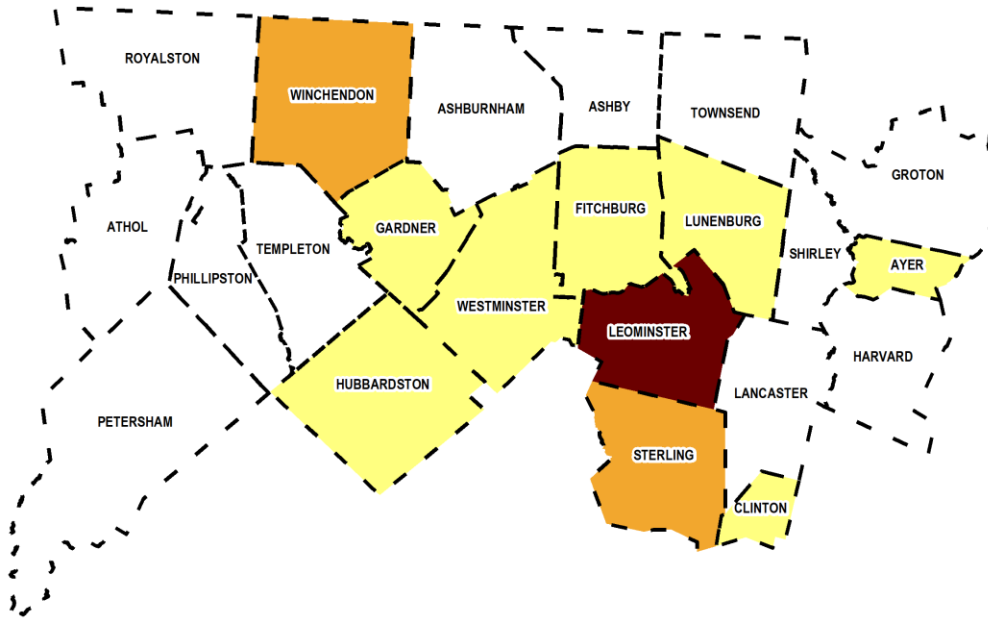
- An examination of Row 5 shows the majority of identified groups benefit disproportionately in these investments when compared to their overall regional population.
- There was one group who saw less total percentage cost than percentage population:
 - The EJ population of Limited English Proficiency (LEP) per Household, in which there is only one such Block Group regionwide

Summary of Equity Analysis

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.

Summary of Community Distribution

The map below shows the geographic equity analysis that was also conducted based on the projects conducted over the past five years for those specific communities. This map corresponds with the five-year lookback table on the previous page. The darker color shows where the most projects were conducted and the communities shown in white had no projects that were specific to that community over the past five years (2016 – 2020).



Based upon this analysis and review, it would appear that the Montachusett MPO is making an effort to address transportation planning issues in Title VI and EJ communities in the Region. Projects compiled in the last five years have been developed in an attempt to locate them in communities which either have an Environmental Justice population, FHWA Title VI population, FTA Title VI population, or a combination of all three. Future efforts should focus on the communities in which no funding has been spent in the recent past. Efforts will be made to continue to monitor such trends and encourage communities, especially those which have not been taking advantage of TIP funds, to engage in the process and develop projects for inclusion.

SPECIAL EFFORTS FOR ELDERLY AND DISABLED

The U.S. Department of Transportation's regulations regarding Nondiscrimination on the Basis of Handicap requires that transit operators certify that "special efforts are being made in its service to provide transportation that handicapped persons, including wheelchair users and semi-ambulatory persons can use." The Montachusett Regional Transit Authority (MART) has been so certified by FTA. The Montachusett Regional Planning Commission annually monitors and updates MART's compliance with the Americans with Disabilities Act Regulations. In compliance with a DOT rule to implement the transportation provisions of the ADA, MART has submitted an ADA compliance Para-transit plan and at this time has met all six criteria established by the Regulations; therefore, the ADA plan is complete. The following policies regarding special efforts are currently in effect.

- half fare on fixed route transit for eligible elderly and disabled individuals;
- fixed route service designed to serve elderly housing, shopping centers, medical facilities, and elderly social centers;
- curb-to-curb service with lift equipped vans provided by local Councils on Aging/private operators;
- continuation of next day ADA eligible van service which operates the same hours as fixed route service;
- operation of Dial-A-MART program which is a coordination of transportation needs of clients of social service agencies;
- no restriction on trip purpose for ADA Para-transit services;
- a thirty-three and one third percent discount on monthly bus passes for eligible elderly and disabled individuals;

FY21 Projects

Projects in the FY21 TIP in the Section 5307 category contain program elements for the elderly and disabled. The estimated costs in the Year 1 Element in the Section 5307 category include the costs of operating the special services described above. Section 5310 projects are awarded by the state through a grant process. Projects awarded within the Montachusett region will be amended into the TIP after award.

FEDERAL LEGISLATION

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), and revisited in the 2020 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 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
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • Promote the development of improvements and options across all modes for areas that serve Title VI and Environmental Justice populations. 	
<ul style="list-style-type: none"> • Monitor fee options in order to maintain equitability for all users. 	
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> Continue the promotion and prioritization of bridge projects throughout the region. 	3. Decrease the number of identified “Structurally Deficient” bridges within the Region.
<ul style="list-style-type: none"> Encourage communities to maintain and monitor trails 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> Seek to promote and expand commuter transit and rail options beyond the urban centers. 	
<ul style="list-style-type: none"> Prioritize and improve railroad and other restricted bridges in order to enhance freight mobility. 	
<ul style="list-style-type: none"> Seek to improve freight and general vehicle access and connection to Route 2 throughout the region. 	

Goal 6 – Improve Transportation Options and Promote Healthy Modes

Objectives	Performance Measures
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> Promote additional bicycle facilities for transit centers and vehicles. 	2. Conduct 3 to 4 walk audits over a 12-year period in interested communities.
<ul style="list-style-type: none"> 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 Healthy Modes (cont.)	
Objectives	Performance Measures
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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).
<ul style="list-style-type: none"> • Encourage communities to promote and support Green Streets through Low Impact (LID) and Transit Oriented (TOD) Development projects as well as stormwater drainage improvement. 	
<ul style="list-style-type: none"> • Encourage and promote transit options to new residential and smart growth developments. 	
<ul style="list-style-type: none"> • 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.

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

On a regional level, MRPC relies on its regional Performance Measures (systems information) to inform the TEC process (investment and policy decisions) to achieve regional performance goals. On the national level, FHWA has established its own Performance Measures to inform decision making.

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 Calendar Year (CY) 2020 on

January 22, 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, 2019.

Safety Performance Measures (PM1)

Montachusett MPO has chosen to adopt the statewide safety performance measure targets set by MassDOT for Calendar Year (CY) 2020. 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 2020 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 2016-2020 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 2020 that remains constant from the rolling average for 2014–2018. 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 Tracker¹ 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 2020, and that Montachusett MPO has adopted, are as follows:

- 1) Fatalities: MassDOT's long-term goal is zero deaths and injuries. That said, for federal reporting purposes, the estimated five-year average of fatalities is 2020 based on historical data, to be reported as part of this exercise, is 347, down from an average of 358 fatalities for the years 2014–2018. [See Total Fatalities Graph] In the Montachusett region, the five-year average fatalities for the years 2014-2018 was 15.
- 2) Rate of Fatalities per 100 million VMT: The target fatality rate for years CY 2020 is 0.56, down from a 0.58 average for years 2014–2018. [See Total Fatalities Graph] In the Montachusett region, the average fatality rate per 100 million VMT in the years 2014-2018 was 0.65.
- 3) Serious Injuries: The target number of incapacitating injuries for CY2020 is 2689, down from the average of 2810 for years 2014–2018. [See Total Incapacitating Injuries Graph] In the Montachusett region, the five-year average number of incapacitating injuries for the years 2014-2018 was 98.
- 4) Rate of Incapacitating Injuries per 100 million VMT: The incapacitating injury rate target for CY2020 is 4.30 per year, down from the 4.57 average rate for years 2014–2018. [See Total Incapacitating Injuries Graph] In the Montachusett region, the five-year average rate of incapacitating injuries per 100 million VMT for the years 2014-2018 was 4.38.
- 5) Total Number of Combined Incapacitating Injuries and Fatalities for Non-Motorized Modes: The CY2020 target number of fatalities and incapacitating injuries for non-motorists is 505 per year, the same as the average for years 2014–2018. [See Total Combined Non-Motorized Injuries and Fatalities Graph] In the Montachusett region, the five-year average total number of combined incapacitating injuries an fatalities for non-motorized modes for the years 2014-2018 was 11.

TOTAL FATALITIES

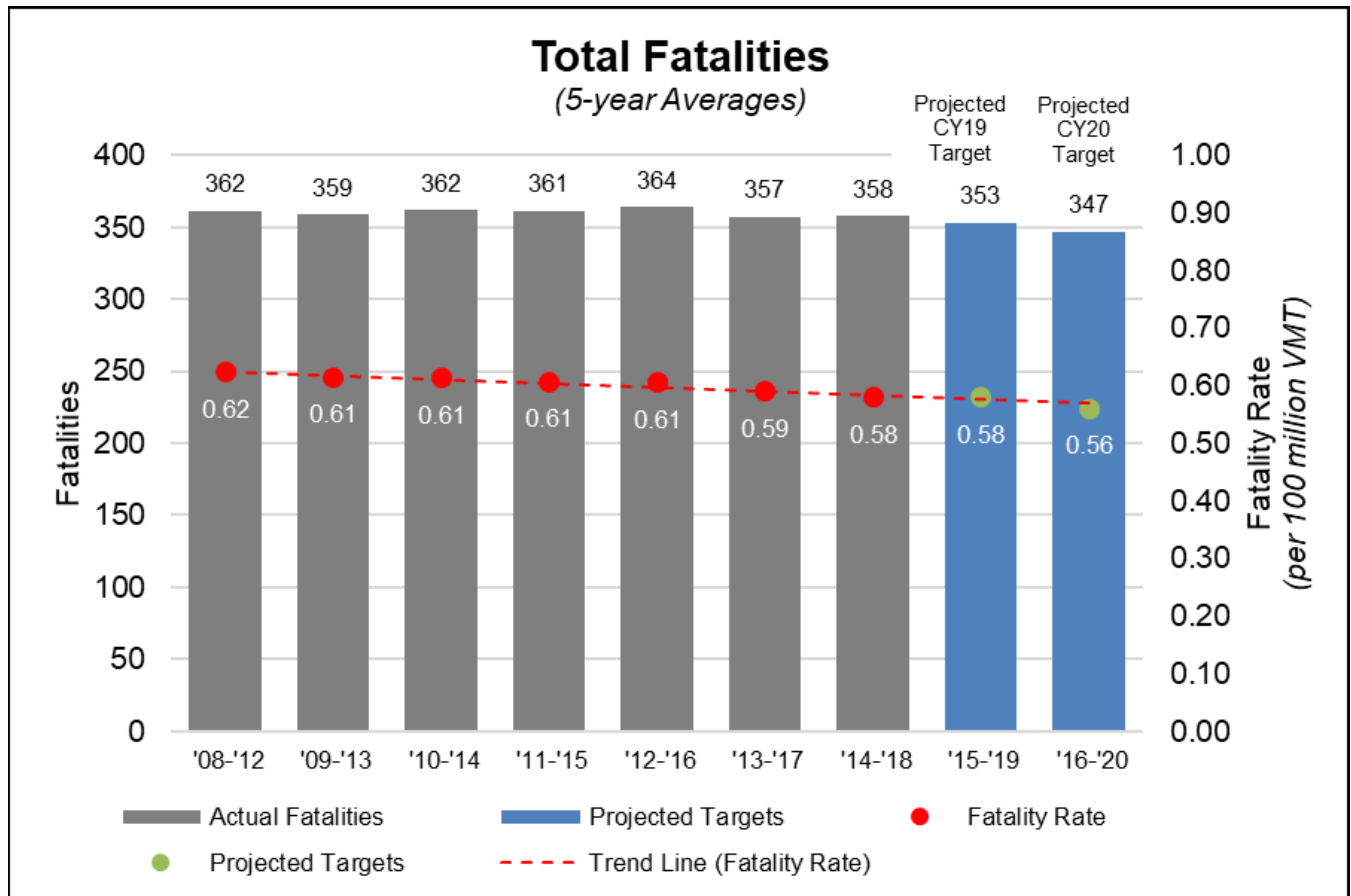
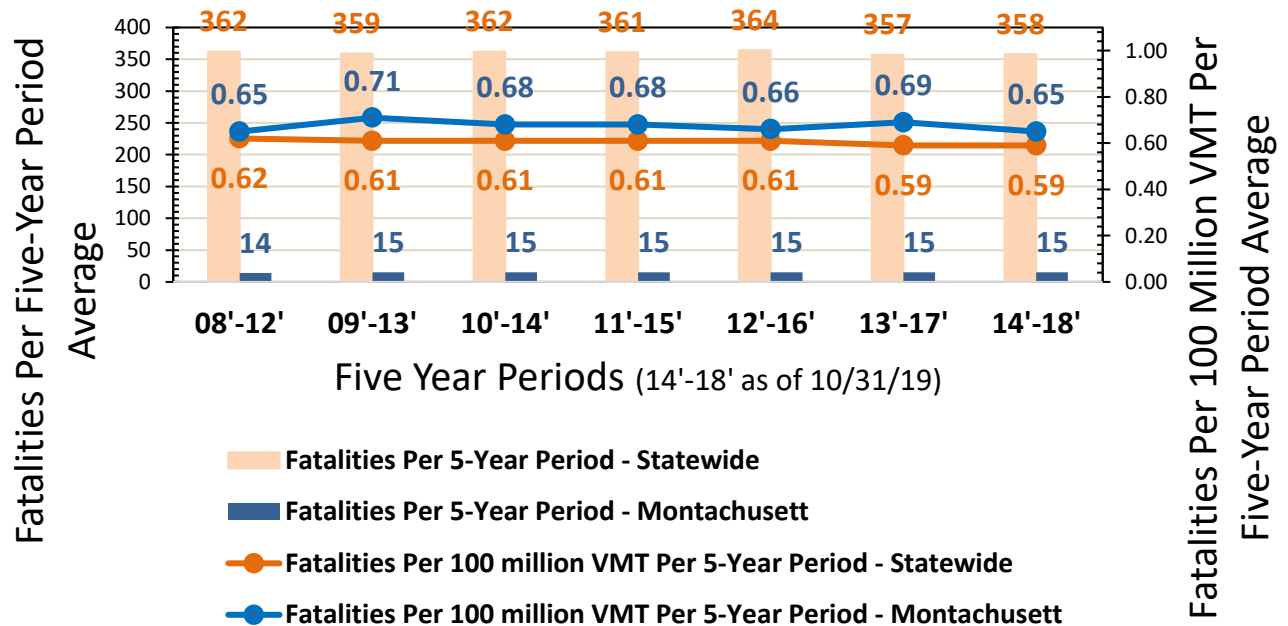


Figure 1 - Total Fatalities Per Year Montachusett vs. Statewide (five year period averages)



TOTAL INCAPACITATING INJURIES

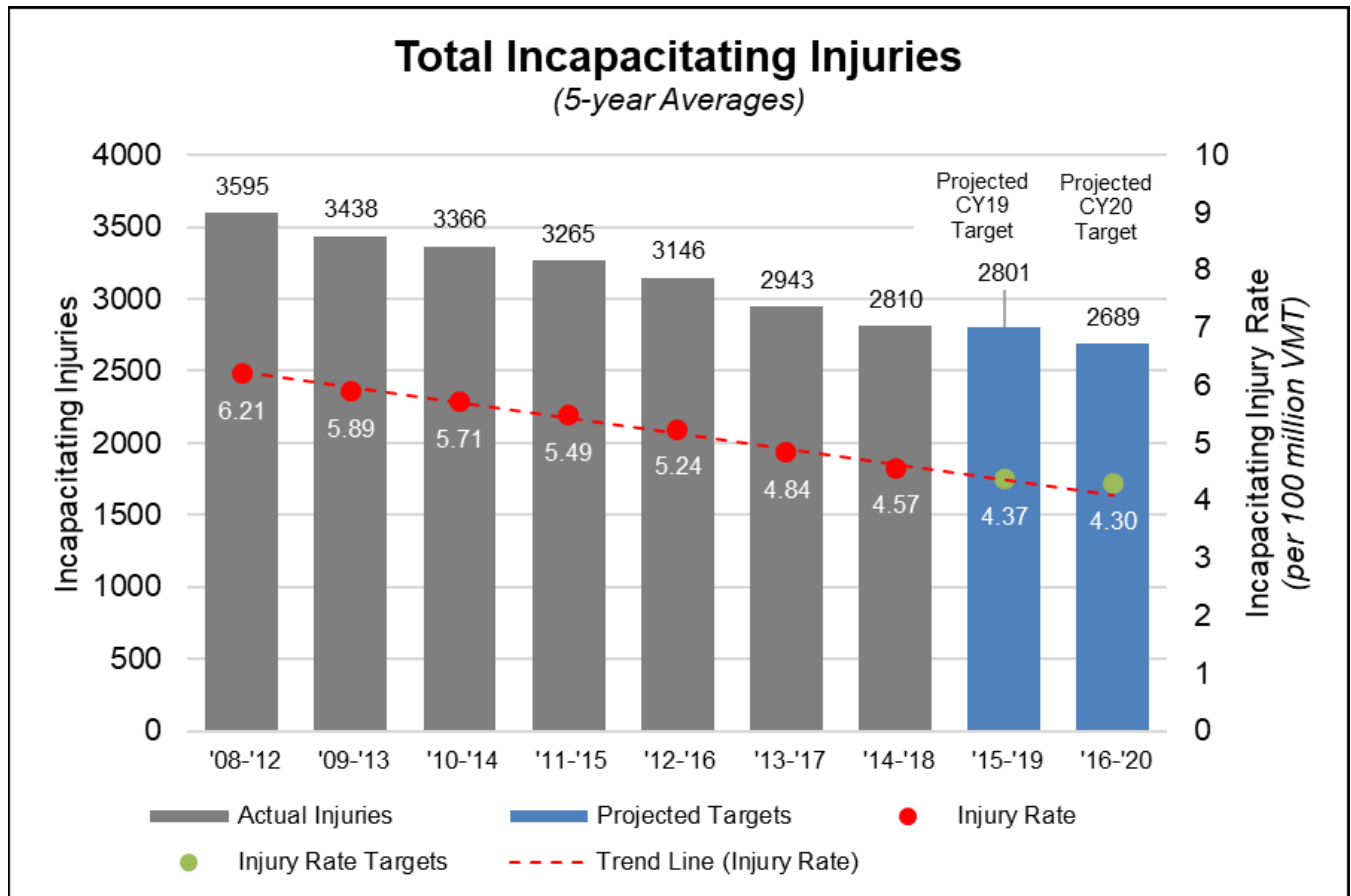
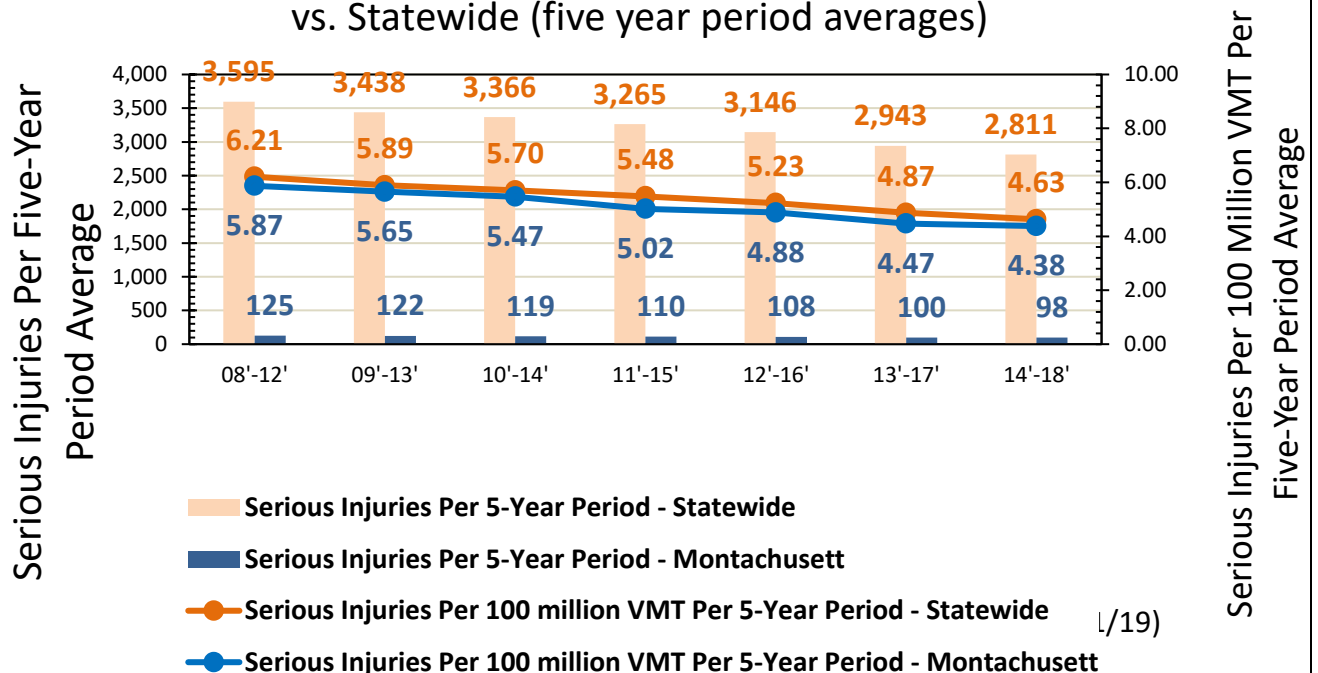


Figure 2 - Total Serious Injuries Per Year Montachusett MPO vs. Statewide (five year period averages)



TOTAL COMBINED NON-MOTORIZED INJURIES AND FATALITIES

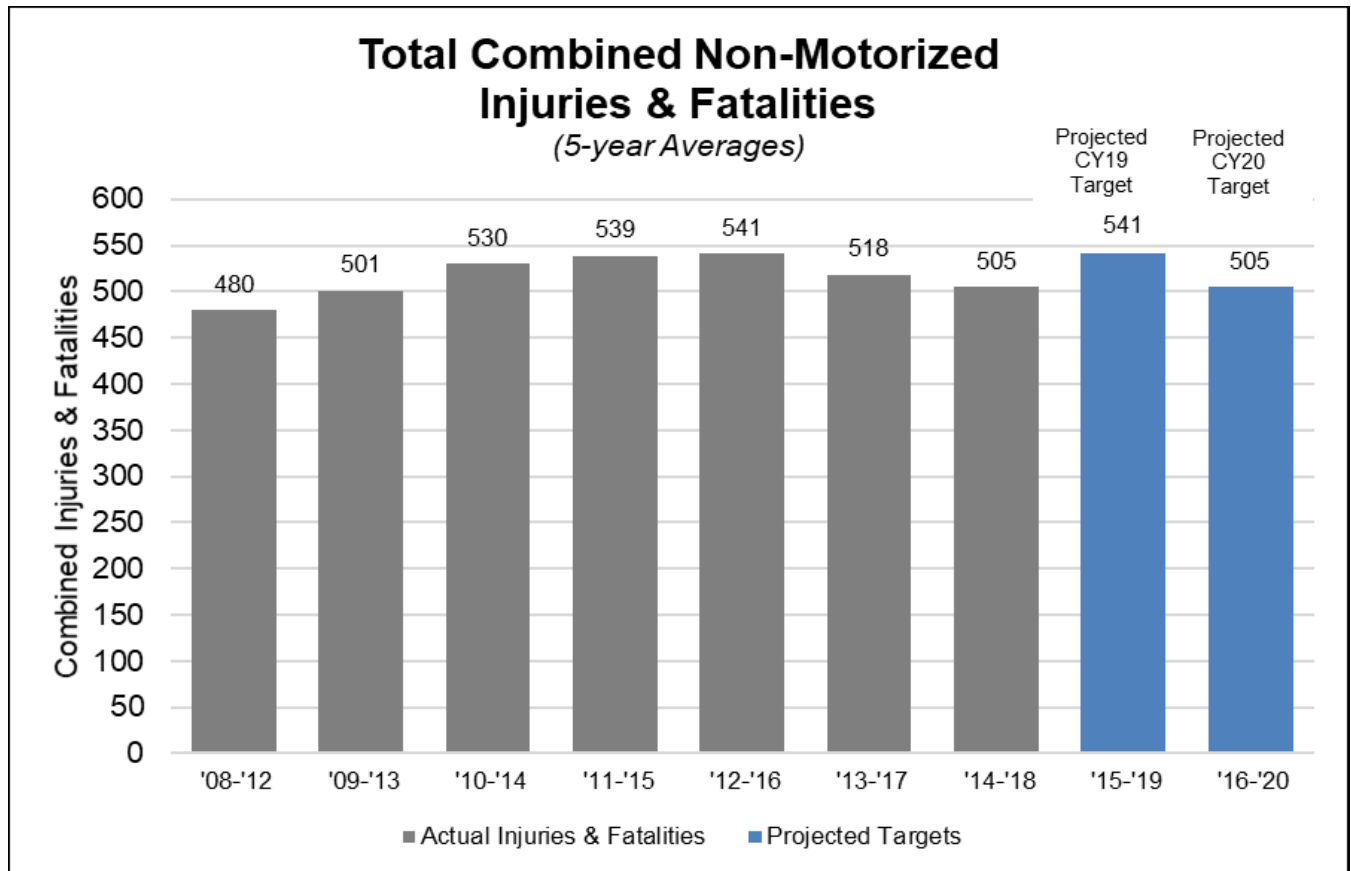
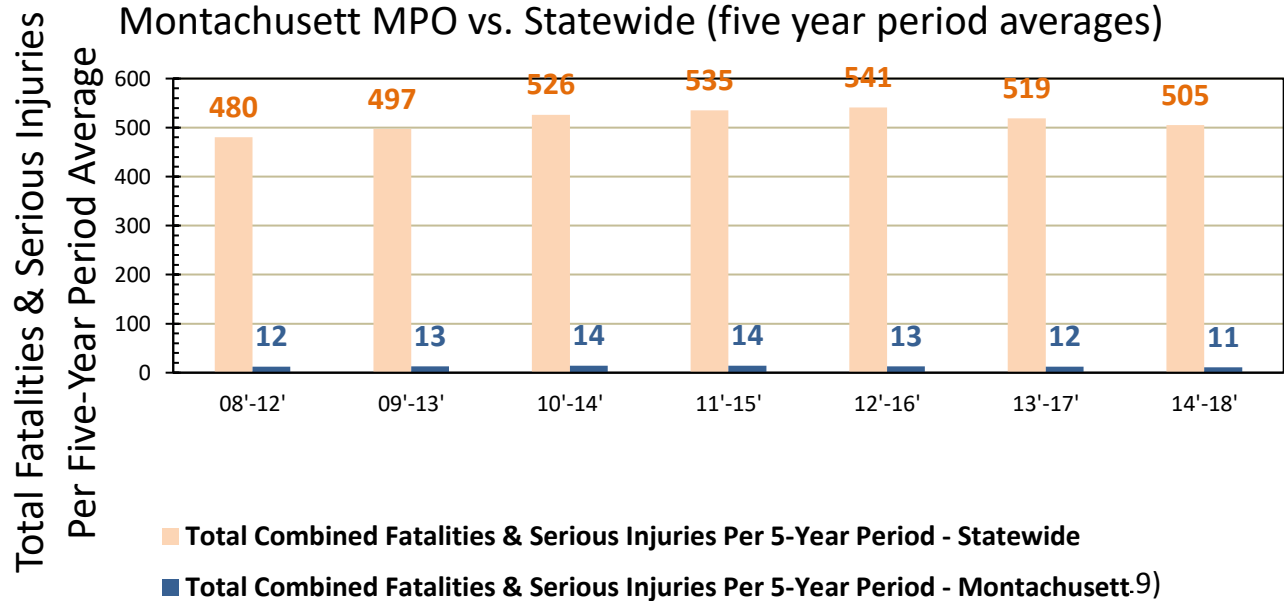


Figure 3 - Total Combined Non-Motorist Fatalities & Serious Injuries

Montachusett MPO vs. Statewide (five year period averages)



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.

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.

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.

TAM Performance Measures and Targets

Asset Category - Performance Measure	Asset Class	2021 Target	2022 Target	2023 Target	2024 Target	2025 Target
REVENUE VEHICLES						
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	<i>BU - Bus</i>	10%	10%	0%	0%	5%
	<i>CU - Cutaway Bus</i>	16%	15%	15%	10%	10%
	<i>MB - Mini-bus</i>	0%	0%	0%	0%	0%
	<i>MV - Mini-van</i>	N/A				
	<i>SV - Sport Utility Vehicle</i>	N/A				
	<i>VN - Van</i>	45%	40%	30%	15%	0%
EQUIPMENT						
Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	<i>Non Revenue/Service Automobile</i>	100%	0%	0%	0%	0%
	<i>Steel Wheel Vehicles</i>	N/A				
	<i>Trucks and other Rubber Tire Vehicles</i>	25%	20%	15%	5%	0%
	<i>Generators</i>	0%	0%	0%	0%	0%
	<i>Solar Panel Arrays</i>	0%	0%	0%	0%	0%
FACILITIES						
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model	<i>Administration</i>	0%	0%	0%	0%	0%
	<i>Maintenance</i>	0%	0%	0%	0%	0%
	<i>Parking Structures</i>	0%	0%	0%	0%	0%
	<i>Passenger Facilities</i>	0%	0%	0%	0%	0%
	<i>Operations/Vehicle Storage</i>	0%	0%	0%	0%	0%

TRANSPORTATION FUNDING PROGRAMS

Description of Highway Programs

Federal Aid is received by the State as reimbursement, and the State is required to contribute a matching share to most projects receiving Federal funds.

The FAST Act has generally maintained the program structure of MAP-21 that had combined several activities previously carried out under existing formula programs into a new core formula program structure. The FAST Act includes the following:

- National Highway Performance Program (NHPP)
- Surface Transportation Block Grant Program (STBGP)
- Highway Safety Improvement Program (HSIP)
- Railway-Highway Grade Crossings Program
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- National Highway Freight Program (NHFP)
- STBGP Set-Aside (formerly the Transportation Alternatives Program (TAP))
- STBG Off System Bridge (STBG-BR-Off)

This TIP includes projects funded under these programs as well as potentially carried over programs from prior federal authorizations such as High Priority Program (HPP) funds.

All of the programs listed are administered by the MassDOT. A project may be initiated by MassDOT or the local community. If approved, the project is submitted to Federal Highway Administration for funding. A description of each of these programs follows:

- National Highway Performance Program (NHPP): The enhanced National Highway Performance Program (NHPP) is composed of rural and urban roads serving major population centers, international border crossings, intermodal transportation facilities, and major travel destinations. It includes the Interstate System, all principal arterials (including some not previously designated as part of the NHS) and border crossings on those routes, highways that provide motor vehicle access between the NHS and major intermodal transportation facilities, and the network of highways important to U.S. strategic defense (STRAHNET) and its connectors to major military installations. The funding split for this program is generally 80% federal 20% state.
- Surface Transportation Block Grant Program (STBGP): The FAST Act converts the long-standing Surface Transportation Program into the Surface Transportation Block Grant Program acknowledging that this program has the most flexible eligibilities among all Federal-aid highway programs and aligning the program's name with how FHWA has historically administered it. The STBG promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs. As under MAP-21, the FAST Act directs FHWA to apportion funding as a lump sum for each State then divide that total among apportioned programs. Each State's STBG apportionment is calculated based on a percentage specified in law. The funding split for this program is generally 80% federal 20% state.
- Highway Safety Improvement Program (HSIP): The FAST Act continues the Highway Safety Improvement Program (HSIP) to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-

State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. The funding split is 90% federal and 10% state.

- Congestion Mitigation and Air Quality (CMAQ): The CMAQ program is continued in the FAST Act to provide a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). The funding split for this program is generally 80% federal 20% state.
- STBGP Set-Aside: The FAST Act eliminates the MAP-21 Transportation Alternatives Program (TAP) and replaces it with a set-aside of Surface Transportation Block Grant (STBG) program funding for transportation alternatives (TA). These set-aside funds include all projects and activities that were previously eligible under TAP, encompassing a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity. The funding split for this program is generally 80% federal 20% state.
- Nationally Significant Freight & Highway Projects (NSFHP) Program: The FAST Act establishes the NSFHP program to provide financial assistance through competitive grants known as FASTLANE grants or credit assistance to nationally and regionally significant freight and highway projects that align with the program goals, i.e. improve safety, efficiency and reliability, generate economic benefits, reduce highway congestion and bottlenecks, improve freight connectivity, enhance the resiliency of critical highway infrastructure, improve roadways vital to national energy security, and address the impacts of population growth on freight and people movement. The funding split is generally 60% federal and 40% other sources. An additional 20% may be funded with other federal assistance dollars.
- High Priority Projects: This program provides designated funding for specific projects identified in SAFETEA-LU. Projects are identified with a specified amount of funding over the 5 years of SAFETEA-LU. The funds designated for a project are available only for that project until expended. HPP projects are fully funded and are included on the TIP when they are expected to be “ready to go.” The funding split is 80% federal and 20% state.
- STBG Off System Bridge (STBG-BR-Off): An off-system bridge is a highway bridge located on a public road that is not a Federal-aid highway. Eligible activities for the set aside for off-system bridges are replacement (including replacement with fill material), rehabilitation, preservation, protection (including painting, scour countermeasures, seismic retrofits, impact protection measures, security countermeasures, and protection against extreme events) and application of calcium magnesium acetate, sodium acetate/formate, or other environmentally acceptable, minimally corrosive anti-icing and deicing compositions for bridges (and approaches to bridges and other elevated structures) and tunnels on public roads of all functional classifications, including any such construction or reconstruction necessary to accommodate other transportation modes.

FAST Act funding information from FHWA Fact Sheets found at the FAST Act website:

<http://www.fhwa.dot.gov/fastact/factsheets/index.cfm>

Glossary of Terms

The terms used in the main part of this TIP are defined as follows:

- MassDOT Project ID: indicates Massachusetts Department of Transportation Highway Division Project Identification Number.
- MassDOT Project Description: indicates the city or town in which the project is to be implemented and gives details of the type of work to be performed and specific locations.
- MassDOT District: indicates in which MassDOT Highway Division District of the Montachusett Region the project occurs. The communities in the MRPC Region fall within District 2, with offices in Northampton, and District 3, with offices in Worcester.
- Funding Source: indicates funding program under which the project is eligible for dollar allocations, such as National Highway Performance Program or Surface Transportation Block Grant Program.
- Total Programmed Funds, Federal Funds, Non-Federal Funds: presented for each project for each fiscal year are estimated total costs and the source/share of the funds, i.e. Federal or State. Projects where costs and activity are not available will be labeled NA.
- Additional Information: indicates information pertinent to the project in order to provide the reader with a more detail look at the project. This includes, if applicable: a) Planning / Design / or Construction; b) total project cost and funding sources used; c) advance construction status; d) MPO project TEC score; e) name of entity receiving a transfer; f) name of entity paying the non-state non-federal match; g) earmark details; h) TAP project proponent; i) other information such as the current cost of the project (in Year 1 dollars) and the Year of Expenditure (YOE) cost based on the inflation factor for that year (i.e. Year 2 – YOE increase of 4%; Year 3 – YOE increase of 8%; Year 4 – YOE increase of 12%; and Year 5 – YOE increase of 16%).

Description of Transit Funding Programs

The FAST Act supports transit funding through fiscal year 2020, reauthorizes FTA programs and includes changes to improve mobility, streamline capital project construction and acquisition, and increase the safety of public transportation systems across the country. Discretionary and Formula funds are also available. Formula grant programs are funded to States based on formulas of population. Each grant program is referred to by name and usually by a number that correlates to the section number of the authorization.

Formula Grants

- Urbanized Area Formula Program (5307) Funds: This formula program makes funds available on the basis of a statutory formula to all urbanized areas in the country. Eligible activities are capital projects, planning and job access/reverse commute projects. Operating assistance is continued as an eligible expense under Section 5307. Operating assistance caps are now in place for urbanized areas over 200,000 but operating fewer than 100 buses (no rail), not just those under 200,000 (as determined by the U.S. Census Bureau), as is the case in previous law.

- Transportation for Elderly Persons and Persons with Disabilities (5310) Funds: This program provides capital funding for transportation services for elderly and disabled persons. Authorization under MAP-21 has moved the formula allocation from a single statewide allocation to an Urbanized Area allocation. The funds may go to private, non-profit organizations or to public bodies which coordinate service. Also funds available to our area are in a single allocation with two other “Small Urban” areas, therefore MassDOT has made all the apportioned funds a competitive application. No less than 55% of these funds must be used for capital projects. Up to 45% may be used for operating assistance projects that would formerly been eligible under New Freedom funds. No more than 10% may be used be a recipient for Administrative Expenses associated with a project. The Rail and Transit Division of the Massachusetts Department of Transportation through the State Transportation Bond authorization program, makes capital grants available through its Mobility Assistance Program to public agencies to purchase vehicles and related equipment for transporting elderly and disabled persons.
- Formula Grants for Other than Urbanized Areas (5311) Funds: program provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations of less than 50,000, where many residents often rely on public transit to reach their destinations. The program also provides funding for state and national training and technical assistance through the Rural Transportation Assistance Program. States must spend at least 15% of its annual apportionment for the development and support of intercity bus transportation, unless it can certify, after consultation with intercity bus service providers, that the intercity bus needs of the state are being adequately met.
- Bus and Bus Facilities (5339) Funds: This program provides capital assistance for new and replacement buses, related equipment, and facilities. These funds have both a formula-based program by urbanized area and a competitive discretionary program. As with the 5310 formula, 5339 is apportioned to our region via the state thru an allocation for “Small Urban,” with a statewide allocation as well. Therefore, a competitive process thru MassDOT has been established for the 3-small urban and 3 rural RTA’s to obtain these funds. The Federal share of eligible capital costs is no more than 80 percent of the net capital project cost. MART can also apply as a direct recipient when competitive funds are released via a Notice of Funding Availability (NOFA) by USDOT/FTA. Since these competitive applications do not coordinate with the timing of MassDOT’s Capital Improvement Plan process and are not guaranteed; they are often matched with Transportation Development (Toll) Credits and later amended into the TIP upon award notification.
- State of Good Repair Formula Grants (5337): Eligible recipients are state and local government authorities in urbanized areas with fixed guideway public transportation facilities operating for at least 7 years. The Montachusett Regional Transit Authority is not an eligible recipient since there is not currently any fixed guideway or high-speed motorbus operated under the authority.

Discretionary Grants

The Federal Transit Administration and the U.S. Department of Transportation still have a few discretionary grant programs that MART is eligible to apply under. A Notice of Funding Availability (NOFA) is published in the Federal Register each year stating program amounts and instructions for applying for these Competitive grants. Please see FTA’s website for more details at <http://www.fta.dot.gov/grants/15926.html>.

- Capital Investment Grants (5309): This is FTA’s primary grant program for funding major transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. It is a discretionary grant program unlike most others in government. Instead of an annual call for applications and selection of awardees by the Federal

Transit Administration (FTA), the law requires that projects seeking CIG funding complete a series of steps over several years to be eligible for funding. For New Starts and Core Capacity projects, the law requires completion of two phases in advance of receipt of a construction grant agreement – Project Development and Engineering. For Small Starts projects, the law requires completion of one phase in advance of receipt of a construction grant agreement – Project Development. The law also requires projects to be rated by FTA at various points in the process according to statutory criteria evaluating project justification and local financial commitment.

- BUILD Discretionary Grants: Better Utilizing Investment to Leverage Development (BUILD) Transportation Discretionary Grants are for planning and capital investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant or regional impact. BUILD funding can support roads, bridges, transit, rail, ports or intermodal transportation.
- Low or No Emission Vehicle Deployment Program (5339 c): The main purpose of the LoNo Program is to deploy the cleanest and most energy efficient U.S.-made transit buses that have been largely proven in testing and demonstrations but are not yet widely deployed in transit fleets. The LoNo Program provides funding for transit agencies for capital acquisitions and leases of zero emission and low-emission transit buses, including acquisition, construction, and leasing of required supporting facilities such as recharging, refueling, and maintenance facilities.
- Public Transportation Innovative and other Research & Technology Programs – 5312: Under the FAST Act there are currently 3 programs eligible under 5312 research/demonstration funds. All of them have the same goal of providing funding to develop innovative products and services assisting transit agencies in better meeting the needs of their customers.
- Pilot Program for Transit-Oriented Development Planning - 5309: helps support FTA’s mission of improving public transportation for America’s communities by providing funding to local communities to integrate land use and transportation planning with a transit capital investment that is seeking or recently received funding through the [Capital Investment Grant \(CIG\) Program](#). Comprehensive planning funded through the program must examine ways to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations.

STATE POLICIES AND DIRECTIVES

weMove Massachusetts

MassDOT released weMove Massachusetts (WMM): Planning for Performance, the Commonwealth of Massachusetts' 2040 Long-Range Transportation Plan (LRTP) in May of 2014. This plan includes seven major components:

- 1) Transportation Reform - emphasis on customers, innovation, accountability, performance management, efficiency, stewardship and stronger collaboration across transportation divisions;
- 2) Data and Analysis - critical to sound decision making;
- 3) Transportation System Needs Identification– to help choose the right transportation investments;
- 4) youMove Massachusetts Themes - ten value statements that capture the diverse values users;
- 5) Customer and Stakeholder Engagement– incorporate the priorities of customers and stakeholders;
- 6) Statewide Transportation Plans– implement modal plans;
- 7) Statewide Priorities and Policies– ensure accountability.

Source: <https://massmoves.org/resource/wemove-massachusetts-planning-for-performance/>

The policies of the Commonwealth will be reviewed, considered and incorporated in the planning studies developed as part of the work tasks outlined in this UPWP. Recommendations derived from these studies will be consistent with state policies.

Healthy Transportation Policy Directive

On September 20, 2013, MassDOT announced the Healthy Transportation Policy Directive designed to increase bicycling, transit and walking options. The directive is intended to promote multimodal access for users of the transportation networks and systems.

The Healthy Transportation Directive builds upon the goals established under MassDOT's GreenDOT Implementation Plan and mode shift goal. The Directive requires all MassDOT Districts to review all projects under design to "ensure they are consistent with ...goals."

Elements included in the Directive are as follows:

All MassDOT facilities will consider adjacent land uses and be designed to include wider sidewalks, landscaping, crossing opportunities and other features to enhance healthy transportation options;

Reviews will be conducted of cluster sites where incidents have occurred with healthy transportation users;

MassDOT will develop a guide to assist communities proposing Shared Use Paths on or along rail beds in order to accelerate the path design process.

Additional information on the Healthy Transportation Policy Directive and MassDOT's GreenDOT comprehensive environmental responsibility and sustainability initiative can be viewed at

<https://www.mass.gov/files/documents/2016/11/pf/greendot.pdf>.

701 CMR 7.00 Use of Road Flaggers and Police Details on Public Works Projects

701 CMR 7.00 (the Regulation) was promulgated and became law on October 3, 2008. Under this Regulation, the CMR is applicable to any Public Works Project that is performed within the limits of, or that impact traffic on, any Public Road. The Municipal Limitation referenced in this Regulation is applicable only to projects where the Municipality is the Awarding Authority.

For all projects contained in the TIP, the Commonwealth is the Awarding Authority. Therefore, all projects must be considered and implemented in accordance with 701 CMR 7.00, and the Road Flagger and Police Detail Guidelines.

By placing a project on the TIP, the Municipality acknowledges that 701 CMR 7.00 is applicable to its project and design and construction will be fully compliant with this Regulation.

This information and additional information relative to guidance and implementation of the Regulation can be found by contacting the MassDOT Highway Division. (www.massdot.state.ma.us/highway/Main.aspx)

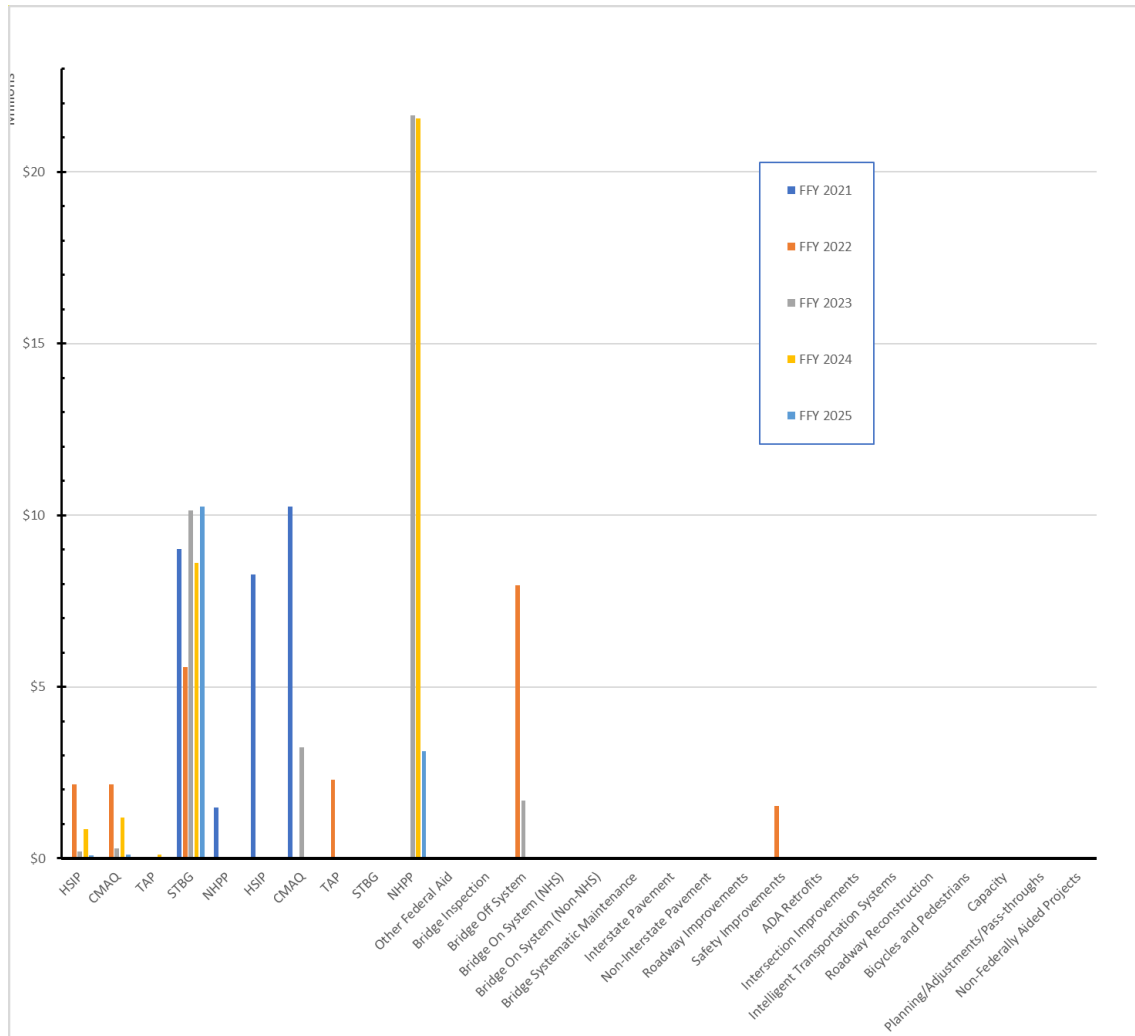
SUMMARY OF PROGRAMMED FUNDS BY FUNDING CATEGORY

The following table and chart present a summary of total funds programmed within the Montachusett Region by funding category for each federal fiscal year of this TIP. All figures presented represent the total project costs, i.e. federal/state/local amounts combined, for that particular funding category.

SUMMARY OF PROGRAMMED FUNDS BY FUNDING CATEGORY – HIGHWAY

Funding Category	FFY 2021	FFY 2022	FFY 2023	FFY 2024	FFY 2025	Total FFY 2021-2025
HSIP	\$0	\$2,159,944	\$206,578	\$860,740	\$80,336	\$3,307,598
CMAQ	\$0	\$2,159,944	\$284,044	\$1,183,517	\$110,462	\$3,737,967
TAP	\$0	\$0	\$25,822	\$107,592	\$10,042	\$143,456
STBG	\$9,024,490	\$5,581,412	\$10,133,264	\$8,607,399	\$10,247,064	\$43,593,629
NHPP	\$1,493,800	\$0	\$0	\$0	\$0	\$1,493,800
HSIP	\$8,275,699	\$0	\$0	\$0	\$0	\$8,275,699
CMAQ	\$10,253,651	\$0	\$3,240,000	\$0	\$0	\$13,493,651
TAP	\$0	\$2,294,916	\$0	\$0	\$0	\$2,294,916
STBG	\$0	\$0	\$0	\$0	\$0	\$0
NHPP	\$0	\$0	\$21,643,187	\$21,562,432	\$3,125,053	\$46,330,672
Other Federal Aid	\$0	\$0	\$0	\$0	\$0	\$0
Bridge Inspection	\$0	\$0	\$0	\$0	\$0	\$0
Bridge Off System	\$0	\$7,964,975	\$1,677,002	\$0	\$0	\$9,641,977
Bridge On System (NHS)	\$0	\$0	\$0	\$0	\$0	\$0
Bridge On System (Non-NHS)	\$0	\$0	\$0	\$0	\$0	\$0
Bridge Systematic Maintenance	\$0	\$0	\$0	\$0	\$0	\$0
Interstate Pavement	\$0	\$0	\$0	\$0	\$0	\$0
Non-Interstate Pavement	\$0	\$0	\$0	\$0	\$0	\$0
Roadway Improvements	\$0	\$0	\$0	\$0	\$0	\$0
Safety Improvements	\$0	\$1,535,040	\$0	\$0	\$0	\$1,535,040
ADA Retrofits	\$0	\$0	\$0	\$0	\$0	\$0
Intersection Improvements	\$0	\$0	\$0	\$0	\$0	\$0
Intelligent Transportation Systems	\$0	\$0	\$0	\$0	\$0	\$0
Roadway Reconstruction	\$0	\$0	\$0	\$0	\$0	\$0
Bicycles and Pedestrians	\$0	\$0	\$0	\$0	\$0	\$0
Capacity	\$0	\$0	\$0	\$0	\$0	\$0
Planning/Adjustments/Pass-throughs	\$0	\$0	\$0	\$0	\$0	\$0
Non-Federally Aided Projects	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal	\$29,047,640	\$21,696,231	\$37,209,897	\$32,321,680	\$13,572,957	\$133,848,405
GREEN = TARGET FUNDS						

SUMMARY OF PROGRAMMED FUNDS BY FUNDING CATEGORY – HIGHWAY

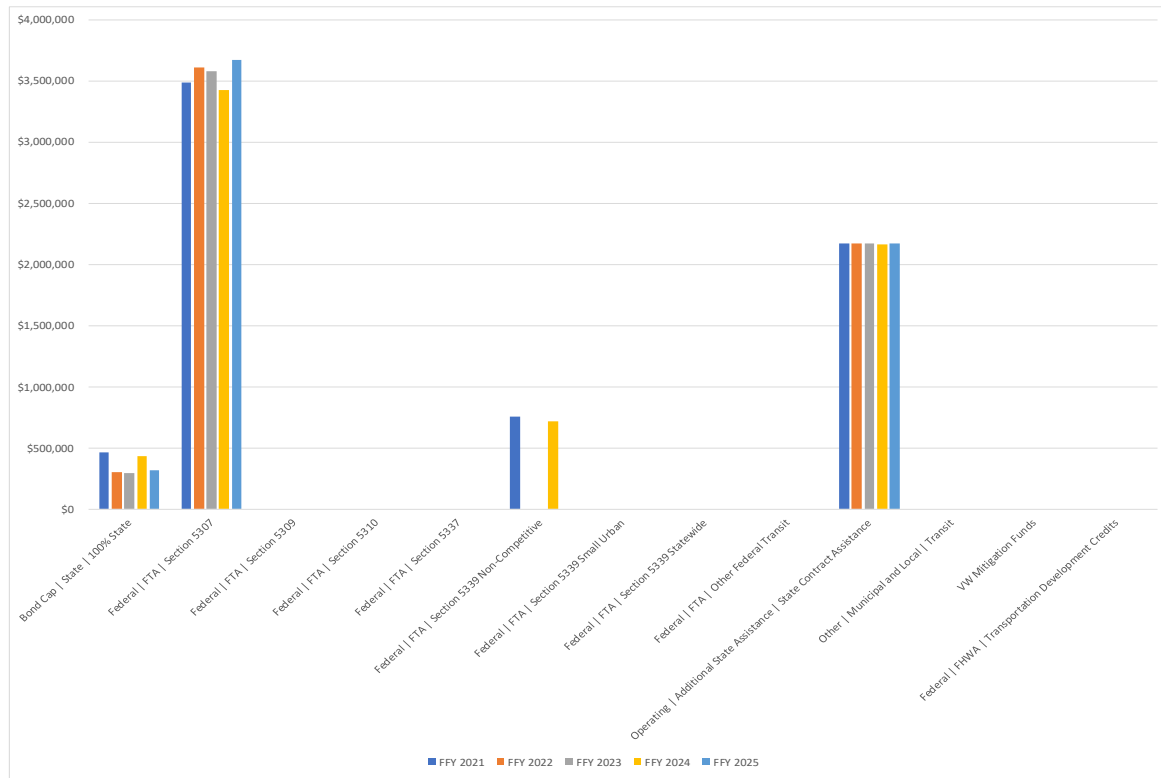


SUMMARY OF PROGRAMMED FUNDS BY FUNDING CATEGORY – TRANSIT

Funding Category	FFY 2021	FFY 2022	FFY 2023	FFY 2024	FFY 2025	Total FFY 2021-2025
Bond Cap | State | 100% State	\$4,000	\$10,000	\$20,000	\$4,000	\$0	\$38,000
Federal | FTA | Section 5307	\$16,000	\$40,000	\$80,000	\$16,000	\$0	\$152,000
Federal | FTA | Section 5309	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FTA | Section 5310	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FTA | Section 5337	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FTA | Section 5339 Non-Competitive	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FTA | Section 5339 Small Urban	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FTA | Section 5339 Statewide	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FTA | Other Federal Transit	\$0	\$0	\$0	\$0	\$0	\$0
Operating | Additional State Assistance | State Contract Assistance	\$0	\$0	\$0	\$0	\$0	\$0
Other | Municipal and Local | Transit	\$0	\$0	\$0	\$0	\$0	\$0
VW Mitigation Funds	\$0	\$0	\$0	\$0	\$0	\$0
Federal | FHWA | Transportation Development Credits	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal	\$20,000	\$50,000	\$100,000	\$20,000	\$0	\$190,000
GRAND TOTAL	\$29,067,640	\$21,746,231	\$37,309,897	\$32,341,680	\$13,572,957	\$134,038,405

NOTE: All funding amounts listed are Total costs that include federal and matching non-federal funds.

SUMMARY OF PROGRAMMED FUNDS BY FUNDING CATEGORY – TRANSIT



SUMMARY OF PROGRAMMED FUNDS BY 2020 RTP STRATEGY

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 development of the 2020 RTP, endorsed July 17, 2019. 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.

From an analysis of the trends identified in 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 the RTP. By tying program funding options to the scenario concepts, a financial plan can be developed and evaluated.

Scenario Development Summary

- 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.
- 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.
- 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)?”
- 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 the RTP.

Scenario 1 - Status Quo examined past TIP funding patterns in order to establish the following a breakdown for the identified funding categories

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.

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.

Each scenario was examined and discussed with both the MJTC and the MPO. After discussion and staff analysis it was determined that Scenario's 2 and 3 would be the ideal funding strategy to follow. Below is a chart of basic funding guidelines which both scenario 2 and 3 share.

SCENARIO 2 & 3 FUNDING PERCENTAGE PER CATEGORY

	Funding Percentage Per Strategy Federal Aid Target Funds Scenario 2 & 3	Total Allocation % to Funding Category
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 ensure the region is following the strategies set in the RTP, it is important to track investments in the TIP. Each Target Section project assigned a year in the 2021 – 2025 TIP was classified under an investment category in the table from above. (ex. A pavement preservation project was considered Road Maintenance & Infrastructure) From this we can see a comparison between the strategies set in the RTP and real investments through the TIP. Although many projects contain components which could be classified under multiple categories, each project category was determined on the most defining attribute of the project. The following Tables show investments contained in this TIP, and a comparison in investments and RTP strategy.

TARGET PROJECTS BY CATEGORY

Project	Year	Cost	Category
607431 - WESTMINSTER- RESURFACING & RELATED WORK ON ROUTE 140, FROM ROUTE 2A TO PATRICIA ROAD	2021	\$1,459,855	Road Maintenance & Infrastructure
608548 - WINCHENDON- IMPROVEMENTS & RELATED WORK ON CENTRAL STREET (ROUTE 202), FROM FRONT STREET TO MAPLE STREET (0.5 MILES)	2021	\$4,505,282	Complete Streets
608657 - LUNENBURG- BRIDGE REHABILITATION, L-17-009, ROUTE 2A OVER PEARL HILL BROOK	2021	\$1,493,800	Road Maintenance & Infrastructure
608888 - GARDNER- RECLAMATION AND RELATED WORK ON PEARSON BOULEVARD	2021	\$1,264,648	Road Maintenance & Infrastructure
608891 - GARDNER- RESURFACING AND RUMBLE STRIP INSTALLATION ON ROUTE 140	2021	\$1,791,202	Road Maintenance & Infrastructure
608779 - LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	2022	\$5,192,173	Congestion Relief
608793 - HUBBARDSTON- HIGHWAY RECONSTRUCTION OF ROUTE 68 (MAIN STREET), FROM 1,000 FT NORTH OF WILLIAMSVILLE ROAD TO ELM STREET	2022	\$4,328,308	Road Maintenance & Infrastructure
604499 - LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	2023 - 2025	\$13,283,024	Road Maintenance & Infrastructure
607432 - WESTMINSTER- REHABILITATION & BOX WIDENING ON ROUTE 140, FROM PATRICIA ROAD TO THE PRINCETON T.L.	2023	\$5,816,581	Road Maintenance & Infrastructure
608784 - TEMPLETON- ROUNDABOUT CONSTRUCTION AT THE INTERSECTION OF PATRIOTS ROAD, SOUTH MAIN STREET, NORTH MAIN STREET AND GARDNER ROAD	2023	\$1,653,316	Safety
609244 - ASHBURNHAM- ROADWAY REHABILITATION ON ROUTE 101 SOUTH	2025	\$5,630,000	Road Maintenance & Infrastructure
609279 - GARDNER- ROUNDABOUT CONSTRUCTION AT ELM STREET, PEARL STREET, CENTRAL STREET AND GREEN STREET	2025	\$2,511,127	Safety

TARGET PROJECT INVESTMENT PERCENTAGE PER CATEGORY

	Federal Aid Target Funds Scenario 2 & 3	Total Allocation % to Funding Category	Investment in 2021- 2025 TIP
1	Road Maintenance & Infrastructure	40%	72%
2	Transit Options	14%	
3	Pedestrian & Bicycle Facilities	12%	
4	Safety (High Crash Locations)	9%	9%
5	Climate Change & Environment	6%	
6	Congestion Relief	4%	11%
7	Complete Streets	5%	9%
8	Regional Access	5%	
9	Community Access	4%	
10	Other	1%	

The previous table indicates a disproportionate amount of investments to the Road Maintenance and Infrastructure category; however, it is important to note many projects contain attributes which can be classified within different categories. Prior to the development of the 2022 – 2026 TIP, MPO staff will work with MassDOT and other project proponents to determine a more complete and accurate representation of where investments are being allocated.

FEDERAL REQUIREMENTS

Financial Plan for the FFY 2021-2025 Transportation Improvement Program Montachusett MPO

The financial plan contained herein is financially constrained and indicates that the Montachusett Metropolitan Planning Organization Transportation Improvement Program (TIP) reflects the highway program emphasis on the maintenance and operation of the current roadway and bridge system with the ability to provide for additional capital improvements. Only projects for which funds can be expected have been included. The following table compares anticipated federal target funds (Federal \$ (M) Target/Availability) to the federal funds for those projects programmed in each Fiscal Year (Federal \$ (M) Programmed). For each fiscal year, programmed funds do not exceed anticipated target funds.

Federal Target Funds vs. Federal Funds Programmed

Funding Category	2021			
	Total \$ (M) Programmed	Federal \$ (M) Programmed	Non-Federal \$ (M) Programmed	Federal \$ (M) Target/ Availability
HSIP	0.000	0.000	0.000	0.000
CMAQ	0.000	0.000	0.000	0.000
TAP	0.000	0.000	0.000	0.000
STBG	9.024	7.220	1.805	0.000
NHPP	1.494	1.195	0.299	0.000
Total TARGET HSIP/CMAQ/TAP/STBG/NHPP	10.518	8.415	2.104	8.681
HSIP	8.276	7.448	0.828	0.000
CMAQ	10.254	8.203	2.051	0.000
TAP	0.000	0.000	0.000	0.000
STBG	0.000	0.000	0.000	0.000
NHPP	0.000	0.000	0.000	0.000
Other Federal Aid	0.000	0.000	0.000	0.000
Bridge Inspection	0.000	0.000	0.000	0.000
Bridge Off System	0.000	0.000	0.000	0.000
Bridge On System (NHS)	0.000	0.000	0.000	0.000
Bridge On System (Non-NHS)	0.000	0.000	0.000	0.000
Bridge Systematic Maintenance	0.000	0.000	0.000	0.000
Interstate Pavement	0.000	0.000	0.000	0.000
Non-Interstate Pavement	0.000	0.000	0.000	0.000
Roadway Improvements	0.000	0.000	0.000	0.000
Safety Improvements	0.000	0.000	0.000	0.000
ADA Retrofits	0.000	0.000	0.000	0.000
Intersection Improvements	0.000	0.000	0.000	0.000
Intelligent Transportation Systems	0.000	0.000	0.000	0.000
Roadway Reconstruction	0.000	0.000	0.000	0.000
Bicycles and Pedestrians	0.000	0.000	0.000	0.000
Capacity	0.000	0.000	0.000	0.000
Planning/Adjustments/Pass-throughs	0.000	0.000	0.000	0.000
Non-Federally Aided Projects	0.000	0.000	0.000	0.000
	29.048	24.066	4.982	8.681
Bond Cap | State | 100% State	0.460	0.000	0.460	0.000
Federal | FTA | Section 5307	3.488	3.488	0.000	0.000
Federal | FTA | Section 5309	0.000	0.000	0.000	0.000
Federal | FTA | Section 5310	0.000	0.000	0.000	0.000
Federal | FTA | Section 5337	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Non-Competitive	0.752	0.752	0.000	0.000
Federal | FTA | Section 5339 Small Urban	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Statewide	0.000	0.000	0.000	0.000
Federal | FTA | Other Federal Transit	0.000	0.000	0.000	0.000
Operating | Additional State Assistance | State Contract Assistance	2.175	0.000	2.175	0.000
Other | Municipal and Local | Transit	0.000	0.000	0.000	0.000
VW Mitigation Funds	0.000	0.000	0.000	0.000
Federal | FHWA | Transportation Development Credits	0.000	0.000		0.000
	6.875	4.240	2.635	0.000

Federal Target Funds vs. Federal Funds Programmed (cont.)

Funding Category	2022			
	Total \$ (M) Programmed	Federal \$ (M) Programmed	Non-Federal \$ (M) Programmed	Federal \$ (M) Target/ Availability
HSIP	2.160	1.944	0.216	0.000
CMAQ	2.160	1.728	0.432	0.000
TAP	0.000	0.000	0.000	0.000
STBG	5.581	4.465	1.116	0.000
NHPP	0.000	0.000	0.000	0.000
Total TARGET HSIP/CMAQ/TAP/STBG/NHPP	9.901	8.137	1.764	8.859
HSIP	0.000	0.000	0.000	0.000
CMAQ	0.000	0.000	0.000	0.000
TAP	2.295	1.836	0.459	0.000
STBG	0.000	0.000	0.000	0.000
NHPP	0.000	0.000	0.000	0.000
Other Federal Aid	0.000	0.000	0.000	0.000
Bridge Inspection	0.000	0.000	0.000	0.000
Bridge Off System	7.965	6.372	1.593	6.372
Bridge On System (NHS)	0.000	0.000	0.000	0.000
Bridge On System (Non-NHS)	0.000	0.000	0.000	0.000
Bridge Systematic Maintenance	0.000	0.000	0.000	0.000
Interstate Pavement	0.000	0.000	0.000	0.000
Non-Interstate Pavement	0.000	0.000	0.000	0.000
Roadway Improvements	0.000	0.000	0.000	0.000
Safety Improvements	1.535	1.382	0.154	1.382
ADA Retrofits	0.000	0.000	0.000	0.000
Intersection Improvements	0.000	0.000	0.000	0.000
Intelligent Transportation Systems	0.000	0.000	0.000	0.000
Roadway Reconstruction	0.000	0.000	0.000	0.000
Bicycles and Pedestrians	0.000	0.000	0.000	0.000
Capacity	0.000	0.000	0.000	0.000
Planning/Adjustments/Pass-throughs	0.000	0.000	0.000	0.000
Non-Federally Aided Projects	0.000	0.000	0.000	0.000
	21.696	17.726	3.970	16.613
Bond Cap | State | 100% State	0.304	0.000	0.304	0.000
Federal | FTA | Section 5307	3.616	3.616	0.000	0.000
Federal | FTA | Section 5309	0.000	0.000	0.000	0.000
Federal | FTA | Section 5310	0.000	0.000	0.000	0.000
Federal | FTA | Section 5337	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Non-Competitive	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Small Urban	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Statewide	0.000	0.000	0.000	0.000
Federal | FTA | Other Federal Transit	0.000	0.000	0.000	0.000
Operating | Additional State Assistance | State Contract Assistance	2.175	0.000	2.175	0.000
Other | Municipal and Local | Transit	0.000	0.000	0.000	0.000
VW Mitigation Funds	0.000	0.000	0.000	0.000
Federal | FHWA | Transportation Development Credits	0.000	0.000		0.000
	6.095	3.616	2.479	0.000

Federal Target Funds vs. Federal Funds Programmed (cont.)

Funding Category	2023			
	Total \$ (M) Programmed	Federal \$ (M) Programmed	Non-Federal \$ (M) Programmed	Federal \$ (M) Target/ Availability
HSIP	0.207	0.186	0.021	0.000
CMAQ	0.284	0.227	0.057	0.000
TAP	0.026	0.021	0.005	0.000
STBG	10.133	8.107	2.027	0.000
NHPP	0.000	0.000	0.000	0.000
Total TARGET HSIP/CMAQ/TAP/STBG/NHPP	10.650	8.540	2.109	8.681
HSIP	0.000	0.000	0.000	0.000
CMAQ	3.240	2.592	0.648	0.000
TAP	0.000	0.000	0.000	0.000
STBG	0.000	0.000	0.000	0.000
NHPP	21.643	17.315	4.329	0.000
Other Federal Aid	0.000	0.000	0.000	0.000
Bridge Inspection	0.000	0.000	0.000	0.000
Bridge Off System	1.677	1.342	0.335	1.342
Bridge On System (NHS)	0.000	0.000	0.000	0.000
Bridge On System (Non-NHS)	0.000	0.000	0.000	0.000
Bridge Systematic Maintenance	0.000	0.000	0.000	0.000
Interstate Pavement	0.000	0.000	0.000	0.000
Non-Interstate Pavement	0.000	0.000	0.000	0.000
Roadway Improvements	0.000	0.000	0.000	0.000
Safety Improvements	0.000	0.000	0.000	0.000
ADA Retrofits	0.000	0.000	0.000	0.000
Intersection Improvements	0.000	0.000	0.000	0.000
Intelligent Transportation Systems	0.000	0.000	0.000	0.000
Roadway Reconstruction	0.000	0.000	0.000	0.000
Bicycles and Pedestrians	0.000	0.000	0.000	0.000
Capacity	0.000	0.000	0.000	0.000
Planning/Adjustments/Pass-throughs	0.000	0.000	0.000	0.000
Non-Federally Aided Projects	0.000	0.000	0.000	0.000
	37.210	29.789	7.421	10.023
Bond Cap | State | 100% State	0.295	0.000	0.295	0.000
Federal | FTA | Section 5307	3.580	3.580	0.000	0.000
Federal | FTA | Section 5309	0.000	0.000	0.000	0.000
Federal | FTA | Section 5310	0.000	0.000	0.000	0.000
Federal | FTA | Section 5337	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Non-Competitive	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Small Urban	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Statewide	0.000	0.000	0.000	0.000
Federal | FTA | Other Federal Transit	0.000	0.000	0.000	0.000
Operating | Additional State Assistance | State Contract Assistance	2.175	0.000	2.175	0.000
Other | Municipal and Local | Transit	0.000	0.000	0.000	0.000
VW Mitigation Funds	0.000	0.000	0.000	0.000
Federal | FHWA | Transportation Development Credits	0.000	0.000		0.000
	6.050	3.580	2.470	0.000

Federal Target Funds vs. Federal Funds Programmed (cont.)

Funding Category	2024			
	Total \$ (M) Programmed	Federal \$ (M) Programmed	Non-Federal \$ (M) Programmed	Federal \$ (M) Target/ Availability
HSIP	0.861	0.775	0.086	0.000
CMAQ	1.184	0.947	0.237	0.000
TAP	0.108	0.086	0.022	0.000
STBG	8.607	6.886	1.721	0.000
NHPP	0.000	0.000	0.000	0.000
Total TARGET HSIP/CMAQ/TAP/STBG/NHPP	10.759	8.693	2.066	8.908
HSIP	0.000	0.000	0.000	0.000
CMAQ	0.000	0.000	0.000	0.000
TAP	0.000	0.000	0.000	0.000
STBG	0.000	0.000	0.000	0.000
NHPP	21.562	17.250	4.312	0.000
Other Federal Aid	0.000	0.000	0.000	0.000
Bridge Inspection	0.000	0.000	0.000	0.000
Bridge Off System	0.000	0.000	0.000	0.000
Bridge On System (NHS)	0.000	0.000	0.000	0.000
Bridge On System (Non-NHS)	0.000	0.000	0.000	0.000
Bridge Systematic Maintenance	0.000	0.000	0.000	0.000
Interstate Pavement	0.000	0.000	0.000	0.000
Non-Interstate Pavement	0.000	0.000	0.000	0.000
Roadway Improvements	0.000	0.000	0.000	0.000
Safety Improvements	0.000	0.000	0.000	0.000
ADA Retrofits	0.000	0.000	0.000	0.000
Intersection Improvements	0.000	0.000	0.000	0.000
Intelligent Transportation Systems	0.000	0.000	0.000	0.000
Roadway Reconstruction	0.000	0.000	0.000	0.000
Bicycles and Pedestrians	0.000	0.000	0.000	0.000
Capacity	0.000	0.000	0.000	0.000
Planning/Adjustments/Pass-throughs	0.000	0.000	0.000	0.000
Non-Federally Aided Projects	0.000	0.000	0.000	0.000
	32.322	25.943	6.378	8.908
Bond Cap | State | 100% State	0.436	0.000	0.436	0.000
Federal | FTA | Section 5307	3.424	3.424	0.000	0.000
Federal | FTA | Section 5309	0.000	0.000	0.000	0.000
Federal | FTA | Section 5310	0.000	0.000	0.000	0.000
Federal | FTA | Section 5337	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Non-Competitive	0.720	0.720	0.000	0.000
Federal | FTA | Section 5339 Small Urban	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Statewide	0.000	0.000	0.000	0.000
Federal | FTA | Other Federal Transit	0.000	0.000	0.000	0.000
Operating | Additional State Assistance | State Contract Assistance	2.163	0.000	2.163	0.000
Other | Municipal and Local | Transit	0.000	0.000	0.000	0.000
VW Mitigation Funds	0.000	0.000	0.000	0.000
Federal | FHWA | Transportation Development Credits	0.000	0.000		0.000
	6.743	4.144	2.599	0.000

Federal Target Funds vs. Federal Funds Programmed (cont.)

Funding Category	2025			
	Total \$ (M) Programmed	Federal \$ (M) Programmed	Non-Federal \$ (M) Programmed	Federal \$ (M) Target/ Availability
HSIP	0.080	0.072	0.008	0.000
CMAQ	0.110	0.088	0.022	0.000
TAP	0.010	0.008	0.002	0.000
STBG	10.247	8.198	2.049	0.000
NHPP	0.000	0.000	0.000	0.000
Total TARGET HSIP/CMAQ/TAP/STBG/NHPP	10.448	8.366	2.082	9.052
HSIP	0.000	0.000	0.000	0.000
CMAQ	0.000	0.000	0.000	0.000
TAP	0.000	0.000	0.000	0.000
STBG	0.000	0.000	0.000	0.000
NHPP	3.125	2.500	0.625	0.000
Other Federal Aid	0.000	0.000	0.000	0.000
Bridge Inspection	0.000	0.000	0.000	0.000
Bridge Off System	0.000	0.000	0.000	0.000
Bridge On System (NHS)	0.000	0.000	0.000	0.000
Bridge On System (Non-NHS)	0.000	0.000	0.000	0.000
Bridge Systematic Maintenance	0.000	0.000	0.000	0.000
Interstate Pavement	0.000	0.000	0.000	0.000
Non-Interstate Pavement	0.000	0.000	0.000	0.000
Roadway Improvements	0.000	0.000	0.000	0.000
Safety Improvements	0.000	0.000	0.000	0.000
ADA Retrofits	0.000	0.000	0.000	0.000
Intersection Improvements	0.000	0.000	0.000	0.000
Intelligent Transportation Systems	0.000	0.000	0.000	0.000
Roadway Reconstruction	0.000	0.000	0.000	0.000
Bicycles and Pedestrians	0.000	0.000	0.000	0.000
Capacity	0.000	0.000	0.000	0.000
Planning/Adjustments/Pass-throughs	0.000	0.000	0.000	0.000
Non-Federally Aided Projects	0.000	0.000	0.000	0.000
	13.573	10.866	2.707	9.052
Bond Cap | State | 100% State	0.318	0.000	0.318	0.000
Federal | FTA | Section 5307	3.672	3.672	0.000	0.000
Federal | FTA | Section 5309	0.000	0.000	0.000	0.000
Federal | FTA | Section 5310	0.000	0.000	0.000	0.000
Federal | FTA | Section 5337	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Non-Competitive	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Small Urban	0.000	0.000	0.000	0.000
Federal | FTA | Section 5339 Statewide	0.000	0.000	0.000	0.000
Federal | FTA | Other Federal Transit	0.000	0.000	0.000	0.000
Operating | Additional State Assistance | State Contract Assistance	2.175	0.000	2.175	0.000
Other | Municipal and Local | Transit	0.000	0.000	0.000	0.000
VW Mitigation Funds	0.000	0.000	0.000	0.000
Federal | FHWA | Transportation Development Credits	0.000	0.000		0.000
	6.165	3.672	2.493	0.000

1. Moneys do not include statewide federal aid or Regional "Mega" projects which are programmed but are excluded from the regional targets provided to MRPC.
2. FTA Programmed amounts are Federal dollars only and do not include state or local shares.

Reliability, Modernization & Expansion Expenditures

For the purposes of this table, Reliability projects are considered those projects that maintain the operation of existing facilities or infrastructure, i.e. resurfacing/rehabilitation of road surfaces, rehabilitation/replacement of a bridge, intersection geometrics, rehabilitation/renovation of existing transit facilities etc.; Modernization projects are assumed to be those projects modernize the transportation system to make it safer and more accessible and to accommodate growth, i.e. projects that go beyond a state of good repair, provide expanded capacity, contain significant safety/accessibility improvements etc.; Expansion projects are those that expand diverse transportation options for communities throughout the Commonwealth, i.e. expanded highway, transit, rail, bicycle and pedestrian networks.

Reliability, Modernization & Expansion Expenditures

FFY		Highway (Fed & NFA)	Transit (Fed & NFA)	Total	Percent of Total
2021	Reliability	\$6,009,505	\$6,875,000	\$12,884,505	35.87%
	Modernization	\$12,784,484	\$0	\$12,784,484	35.59%
	Expansion	\$10,253,651	\$0	\$10,253,651	28.54%
	Total	\$29,047,640	\$6,875,000	\$35,922,640	
2022	Reliability	\$12,466,415	\$6,075,000	\$18,541,415	66.72%
	Modernization	\$9,229,816	\$20,000	\$9,249,816	33.28%
	Expansion	\$0	\$0	\$0	0.00%
	Total	\$21,696,231	\$6,095,000	\$27,791,231	
2023	Reliability	\$29,602,096	\$6,050,000	\$35,652,096	82.41%
	Modernization	\$4,367,801	\$0	\$4,367,801	10.10%
	Expansion	\$3,240,000	\$0	\$3,240,000	7.49%
	Total	\$37,209,897	\$6,050,000	\$43,259,897	
2024	Reliability	\$21,562,432	\$6,742,500	\$28,304,932	72.46%
	Modernization	\$10,759,248	\$0	\$10,759,248	27.54%
	Expansion	\$0	\$0	\$0	0.00%
	Total	\$32,321,680	\$6,742,500	\$39,064,180	
2025	Reliability	\$9,655,853	\$6,165,000	\$15,820,853	80.15%
	Modernization	\$3,917,104	\$0	\$3,917,104	19.85%
	Expansion	\$0	\$0	\$0	0.00%
	Total	\$13,572,957	\$6,165,000	\$19,737,957	
		\$133,848,405	\$31,927,500	\$165,775,905	

STATUS OF PREVIOUS ANNUAL ELEMENT PROJECTS

Status of FFY 2020 Montachusett Highway TIP Projects

Target Projects

Project No.	Community	Description	Status
605651	Leominster	LEOMINSTER- RECONSTRUCTION ON ROUTE 13, FROM HAWES STREET TO PROSPECT STREET	PS&E Received 5/20/2019; Construction Begins: Autumn 2020
607902	Ayer	AYER- RECLAMATION & RELATED WORK ON ROUTE 2A, FROM HARVARD ROAD TO MAIN STREET	PS&E Received 11/19/2019; Construction Begins: Summer 2020

Non-Target Projects

Project No.	Community	Description	Status
608635	Shirley	SHIRLEY- BRIDGE REPLACEMENT, S-13-005, CARRYING LONGLEY ROAD OVER THE MUPUS BROOK	PS&E Received 2/3/2019; Construction Begins: Summer 2020
608639	Westminster	WESTMINSTER- BRIDGE REPLACEMENT, W-28-010, CARRYING WHITMANVILLE ROAD OVER THE WHITMAN RIVER	100% Design Received 2/2/2020; Construction Begins: Autumn 2020
609397	Multiple	ATHOL-PHILLIPSTON - RESURFACING AND RELATED WORK ON ROUTE 2	Advertised for Construction 3/14/20; Construction Begins: Summer 2020
609411	Fitchburg	FITCHBURG- LEOMINSTER- RAIL TRAIL CONSTRUCTION (TWIN CITIES RAIL TRAIL) - PHASE 2	Moved to 2021

Status of Transit Projects

RTA	Section	Description	Federal Funds	Approval Status	Grant #	Comments
Montachusett	5307	50/50 Operating Assistance	\$2,000,000	Unobligated	TBD MA-2020-xx	Award application in process. FY20 expenses incurred – will need to increase budget
Montachusett	5307	ADA Paratransit Service	\$250,000	Unobligated	TBD	Award application in process.
Montachusett	5307	Acquire Misc. Support Equip.	\$98,000	Unobligated	TBD	Award application in process. Some expenses incurred.
Montachusett	5307	Buy Replacement Vans (5)	\$268,000	Unobligated	TBD	Award application in process. Vans under contract
Montachusett	5307	Buy Replacement <30 FT Bus (2)	\$200,000	Unobligated	TBD	Award application in process. Vehicles under contract
Montachusett	5307	Construct – Misc. Equipment for Ayer Parking Garage	\$228,000	Unobligated	TBD	Award application in process. Most activities complete. 1 subproject left to begin.
Montachusett	5307	Rehab Admin/Maintenance Facility	\$150,000	Unobligated	TBD	Award application in process.
Montachusett	5307	Intermodal Rehab (Transit)	\$6,000	Unobligated	TBD	Award application in process. Some expenses incurred.
Montachusett	5307	50/50 Operating Assistance	\$2,345,183	Obligated	MA-2019-13	Funds Fully Expended
Montachusett	5307	ADA Paratransit Service	\$300,000	Obligated	MA-2019-13	Funds Fully Expended
Montachusett	5307	Acquire Misc. Support Equip.	\$72,000	Obligated	MA-2019-13	Funds Fully Expended
Montachusett	5307	Ayer Parking Garage Supplemental Funds	\$840,000	Obligated	MA-2019-13	Funds Fully Expended
Montachusett	5339	Buy Replacement Vans (5)	\$252,320	Obligated	MA-2019-13	Funds Fully Expended
Montachusett	5339	Buy Replacement 30ft Bus (2)	\$551,200	Obligated	MA-2019-13	Funds Fully Expended
Montachusett	5339	Buy Bike Racks & Bus Equip	\$13,052	Obligated	MA-2019-13	Project on hold
Montachusett	5307	Acquire – Bus Route Signing	\$360,000	Obligated	MA-2018-27	Project Cancelled. Funds moved to Operating
Montachusett	5307 CMAQ	Wachusett Station Enhancements	\$296,000	Obligated	MA-2017-08	\$128K in outlays; \$168K remains to be obligated
Montachusett	5307	Acquire Misc Support Equip	\$240,000	Obligated	MA-90-X705	\$49K in open contract; remaining funds are obligated
Montachusett	FHWA 113	Ayer Parking Garage Design & Construction	\$3,229,064	Obligated	MA-55-0006	Funds Fully Expended

AIR QUALITY CONFORMITY INFORMATION - MONTACHUSETT METROPOLITAN PLANNING ORGANIZATION - FFY 2021-2025 TRANSPORTATION IMPROVEMENT PROGRAM

This section documents the latest air quality conformity determination for the 1997 ozone National Ambient Air Quality Standards (NAAQS) in the Montachusett MPO 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.

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 2017. The Public Participation Plan ensures that the public will have access to the Montachusett Region TIP/RTP and all supporting documentation, provides for public notification of the availability of the Montachusett Region TIP/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 Montachusett Region TIP/RTP and related certification documents.

Copies of the Montachusett MPO PPP can be downloaded from the MRPC website at:

www.mrpc.org/transportation/pages/public-involvement

or directly at: www.mrpc.org/sites/montachusetttrpc/files/file/file/mpo_endorsed_ppp_w_amendment_3_15_2017.pdf

The public comment period for this conformity determination commenced on or about April 23, 2019. During the 21-day public comment period, any comments received will be 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 or about May 13, 2019 and subsequently, the Montachusett MPO is expected to endorse this air quality conformity determination on May 15, 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 or 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 must be fiscally constrained consistent with DOT's metropolitan planning regulations at 23 CFR part 450. The Montachusett Region 2020-2024 Transportation Improvement Program and 2020-2040 Regional Transportation Plan are fiscally constrained. This is demonstrated in this TIP under the individual FFY project listings and the Financial Plan section beginning on page 38. Fiscal constraint for the Regional Transportation Plan can be found within the chapter labeled as such.

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.

TRANSPORTATION AND TRANSIT PROJECT PRIORITIES: FEDERAL & STATE SECTIONS

Please note that the projects listed represent the best available information at the time of compilation. Actual implementation is subject to right of way, design, land taking, local action and/or other issues that could delay project time frames and subsequently advertising and award dates.

In addition, federal guidance requires that the TIP reflect Year of Expenditure (YOE) dollars for projects and programs. To accommodate this requirement, individual project cost estimates provided by MassDOT have been adjusted by a four percent per year inflation factor depending upon its year of placement in the TIP (for this TIP, Federal Years 2022, 2023, 2024 and 2025). Year 1 cost estimates remain as provided but projects in Year 2, 3, 4 or 5 (i.e. FFY 2022, 2023, 2024 or 2025) have been increased by a YOE factor of 4%, 8%, 12% or 16%, respectively.

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STIP Investments Report

Montachusett Region

STIP: 2021 - 2025 (D)											
Year	MassDOT Project ID	MPO	Municipality	MassDOT Project Description	District	Funding Source	Adjusted TFPC	Total Programmed Funds	Federal Funds	Non-Federal Funds	Other Information
Federal Fiscal Year 2021								\$29,047,640	\$24,065,682	\$4,981,958	
Section 1A / Regionally Prioritized Projects								\$10,518,290	\$8,414,632	\$2,103,658	
Roadway Reconstruction								\$7,233,288	\$5,786,630	\$1,446,658	
2021	607431	Montachusett	Westminster	WESTMINSTER- RESURFACING & RELATED WORK ON ROUTE 140, FROM ROUTE 2A TO PATRICIA ROAD	3	STBG	\$1,459,855	\$1,459,855	\$1,167,884	\$291,971	Construction; STBG; FFY 2021
2021	608548	Montachusett	Winchendon	WINCHENDON- IMPROVEMENTS & RELATED WORK ON CENTRAL STREET (ROUTE 202), FROM FRONT STREET TO MAPLE STREET (0.5 MILES)	2	STBG	\$4,508,785	\$4,508,785	\$3,607,028	\$901,757	Construction; STBG; FFY 2021
2021	608888	Montachusett	Gardner	GARDNER- RECLAMATION AND RELATED WORK ON PEARSON BOULEVARD	3	STBG	\$1,264,648	\$1,264,648	\$1,011,718	\$252,930	Construction; STBG; FFY 2021
Bridge On-system NHS								\$1,493,800	\$1,195,040	\$298,760	
2021	608657	Montachusett	Lunenburg	LUNENBURG- BRIDGE REHABILITATION, L-17-009, ROUTE 2A OVER PEARL HILL BROOK	3	NHPP	\$1,493,800	\$1,493,800	\$1,195,040	\$298,760	Construction; STBG; FFY 2021
Non-Interstate Pavement								\$1,791,202	\$1,432,962	\$358,240	
2021	608891	Montachusett	Gardner	GARDNER- RESURFACING AND RUMBLE STRIP INSTALLATION ON ROUTE 140	3	STBG	\$1,791,202	\$1,791,202	\$1,432,962	\$358,240	Construction; STBG; FFY 2021
Section 2B / State Prioritized Modernization Projects								\$8,275,699	\$7,448,129	\$827,570	
Intersection Improvements								\$8,275,699	\$7,448,129	\$827,570	
2021	608561	Montachusett	Leominster	LEOMINSTER- IMPROVEMENTS AT ROUTE 12 (NORTH MAIN STREET) AT HAMILTON STREET; ROUTE 12 (NORTH MAIN STREET) AT NELSON STREET	3	HSIP	\$8,275,699	\$8,275,699	\$7,448,129	\$827,570	
Section 2C / State Prioritized Expansion Projects								\$10,253,651	\$8,202,921	\$2,050,730	
Bicycle and Pedestrian								\$10,253,651	\$8,202,921	\$2,050,730	
2021	609411	Montachusett	Multiple	FITCHBURG- LEOMINSTER- TWIN CITIES RAIL TRAIL CONSTRUCTION (PHASE II)	3	CMAQ	\$10,253,651	\$10,253,651	\$8,202,921	\$2,050,730	



STIP Investments Report

Montachusett Region

STIP: 2021 - 2025 (D)											
Year	MassDOT Project ID	MPO	Municipality	MassDOT Project Description	District	Funding Source	Adjusted TFPC	Total Programmed Funds	Federal Funds	Non-Federal Funds	Other Information
Federal Fiscal Year 2022								\$21,696,231	\$17,726,483	\$3,969,748	
Section 1A / Regionally Prioritized Projects								\$9,901,300	\$8,137,034	\$1,764,266	
Intersection Improvements								\$5,399,860	\$4,535,882	\$863,978	
2022	608779	Montachusett	Lancaster	LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	3	CMAQ	\$5,399,860	\$2,159,944	\$1,727,955	\$431,989	Construction; STBG, CMAQ, HSIP; FFY 2022
2022	608779	Montachusett	Lancaster	LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	3	HSIP	\$5,399,860	\$2,159,944	\$1,943,950	\$215,994	Construction; STBG, CMAQ, HSIP; FFY 2022
2022	608779	Montachusett	Lancaster	LANCASTER- INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	3	STBG	\$5,399,860	\$1,079,972	\$863,978	\$215,994	Construction; STBG, CMAQ, HSIP; FFY 2022
Roadway Reconstruction								\$4,501,440	\$3,601,152	\$900,288	
2022	608793	Montachusett	Hubbardston	HUBBARDSTON- HIGHWAY RECONSTRUCTION OF ROUTE 68 (MAIN STREET), FROM 1,000 FT NORTH OF WILLIAMSVILLE ROAD TO ELM STREET	3	STBG	\$4,501,440	\$4,501,440	\$3,601,152	\$900,288	Construction; STBG; FFY 2022
Section 2A / State Prioritized Reliability Projects								\$9,500,015	\$7,753,516	\$1,746,499	
Bridge Off-system								\$7,964,975	\$6,371,980	\$1,592,995	
2022	605296	Montachusett	Fitchburg	FITCHBURG- BRIDGE PRESERVATION, F-04-011, CIRCLE STREET OVER NORTH NASHUA RIVER	3	STBG-BR-Off	\$3,438,127	\$3,438,127	\$2,750,502	\$687,625	
2022	608850	Montachusett	Petersham	PETERSHAM- BRIDGE REPLACEMENT, P-08-002, GLEN VALLEY ROAD OVER EAST BRANCH OF SWIFT RIVER	2	STBG-BR-Off	\$4,526,848	\$4,526,848	\$3,621,478	\$905,370	
Safety Improvements								\$1,535,040	\$1,381,536	\$153,504	
2022	609314	Montachusett	Ashby	ASHBY- INTERSECTION IMPROVEMENTS AT GREENVILLE ROAD (ROUTE 31) AND TURNPIKE ROAD	3	HSIPR	\$1,535,040	\$1,535,040	\$1,381,536	\$153,504	
Section 2B / State Prioritized Modernization Projects								\$2,294,916	\$1,835,933	\$458,983	
Roadway Reconstruction								\$2,294,916	\$1,835,933	\$458,983	
2022	609529	Montachusett	Leominster	LEOMINSTER- VISCOLOID AVENUE IMPROVEMENTS (SRTS)	3	TAP	\$1,124,916	\$1,124,916	\$899,933	\$224,983	
2022	610672	Montachusett	Gardner	GARDNER- ELM STREET RESURFACING AND SIDEWALK IMPROVEMENTS - SRTS	3	TAP	\$1,170,000	\$1,170,000	\$936,000	\$234,000	



STIP Investments Report

Montachusett Region

STIP: 2021 - 2025 (D)											
Year	MassDOT Project ID	MPO	Municipality	MassDOT Project Description	District	Funding Source	Adjusted TFPC	Total Programmed Funds	Federal Funds	Non-Federal Funds	Other Information
Federal Fiscal Year 2023								\$37,209,897	\$29,788,575	\$7,421,322	
Section 1A / Regionally Prioritized Projects								\$10,649,708	\$8,540,424	\$2,109,284	
Roadway Reconstruction								\$10,649,708	\$8,540,424	\$2,109,284	
2023	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	CMAQ	\$14,345,666	\$284,044	\$227,235	\$56,809	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2023	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	HSIP	\$14,345,666	\$206,578	\$185,920	\$20,658	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2023	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	STBG	\$14,345,666	\$2,065,776	\$1,652,621	\$413,155	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2023	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	TAP	\$14,345,666	\$25,822	\$20,658	\$5,164	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2023	607432	Montachusett	Westminster	WESTMINSTER- REHABILITATION & BOX WIDENING ON ROUTE 140, FROM PATRICIA ROAD TO THE PRINCETON T.L.	3	STBG	\$6,281,907	\$6,281,907	\$5,025,526	\$1,256,381	Construction; STBG; FFY 2023
2023	608784	Montachusett	Templeton	TEMPLETON- ROUNDABOUT CONSTRUCTION AT THE INTERSECTION OF PATRIOTS ROAD, SOUTH MAIN STREET, NORTH MAIN STREET AND GARDNER ROAD	2	STBG	\$1,785,581	\$1,785,581	\$1,428,465	\$357,116	Construction; STBG; FFY 2023
Section 2A / State Prioritized Reliability Projects								\$23,320,189	\$18,656,151	\$4,664,038	
Bridge On-system NHS								\$21,643,187	\$17,314,550	\$4,328,637	
2023	608189	Montachusett	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	3	NHPP	\$21,643,187	\$21,643,187	\$17,314,550	\$4,328,637	
Bridge Off-system								\$1,677,002	\$1,341,602	\$335,400	
2023	609187	Montachusett	Hubbardston	HUBBARDSTON- BRIDGE REPLACEMENT, H-24-003, WILLIAMSVILLE ROAD OVER THE BURNSHIRT BROOK	3	STBG-BR-Off	\$1,677,002	\$1,677,002	\$1,341,602	\$335,400	
Section 2C / State Prioritized Expansion Projects								\$3,240,000	\$2,592,000	\$648,000	
Bicycle and Pedestrian								\$3,240,000	\$2,592,000	\$648,000	
2023	609108	Montachusett	Gardner	GARDNER- BIKE PATH BRIDGE CONSTRUCTION, NORTH CENTRAL PATHWAY OVER ROUTE 140	3	CMAQ	\$3,240,000	\$3,240,000	\$2,592,000	\$648,000	



STIP Investments Report

Montachusett Region

STIP: 2021 - 2025 (D)

Year	MassDOT Project ID	MPO	Municipality	MassDOT Project Description	District	Funding Source	Adjusted TFPC	Total Programmed Funds	Federal Funds	Non-Federal Funds	Other Information
Federal Fiscal Year 2024								\$32,321,680	\$25,943,418	\$6,378,262	
Section 1A / Regionally Prioritized Projects								\$10,759,248	\$8,693,472	\$2,065,776	
Roadway Reconstruction								\$10,759,248	\$8,693,472	\$2,065,776	
2024	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	CMAQ	\$14,345,666	\$1,183,517	\$946,814	\$236,703	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2024	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	HSIP	\$14,345,666	\$860,740	\$774,666	\$86,074	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2024	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	STBG	\$14,345,666	\$8,607,399	\$6,885,919	\$1,721,480	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2024	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	TAP	\$14,345,666	\$107,592	\$86,074	\$21,518	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
Section 2A / State Prioritized Reliability Projects								\$21,562,432	\$17,249,946	\$4,312,486	
Non-Interstate Pavement								\$21,562,432	\$17,249,946	\$4,312,486	
2024	609107	Montachusett	Multiple	PHILLIPSTON- TEMPLETON- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	2	NHPP	\$7,306,824	\$7,306,824	\$5,845,459	\$1,461,365	
2024	610729	Montachusett	Multiple	GARDNER- WESTMINSTER- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	3	NHPP	\$7,103,332	\$7,103,332	\$5,682,666	\$1,420,666	
2024	610730	Montachusett	Multiple	WESTMINSTER- FITCHBURG- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	3	NHPP	\$7,152,276	\$7,152,276	\$5,721,821	\$1,430,455	



STIP Investments Report

Montachusett Region

STIP: 2021 - 2025 (D)											
Year	MassDOT Project ID	MPO	Municipality	MassDOT Project Description	District	Funding Source	Adjusted TFPC	Total Programmed Funds	Federal Funds	Non-Federal Funds	Other Information
Federal Fiscal Year 2025								\$13,572,957	\$10,866,399	\$2,706,558	
Section 1A / Regionally Prioritized Projects								\$10,447,904	\$8,366,357	\$2,081,547	
Roadway Reconstruction								\$10,447,904	\$8,366,357	\$2,081,547	
2025	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	CMAQ	\$14,345,666	\$110,462	\$88,370	\$22,092	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2025	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	HSIP	\$14,345,666	\$80,336	\$72,302	\$8,034	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2025	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	STBG	\$14,345,666	\$803,357	\$642,686	\$160,671	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2025	604499	Montachusett	Leominster	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	3	TAP	\$14,345,666	\$10,042	\$8,034	\$2,008	Construction; Funding: STBG, CMAQ, HSIP, TAP; AC'd 3 Years (FFY 2023-2025)
2025	609244	Montachusett	Ashburnham	ASHBURNHAM- ROADWAY REHABILITATION ON ROUTE 101 SOUTH	3	STBG	\$6,530,800	\$6,530,800	\$5,224,640	\$1,306,160	Construction; STBG; FFY 2025
2025	609279	Montachusett	Gardner	GARDNER- ROUNDABOUT CONSTRUCTION AT ELM STREET, PEARL STREET, CENTRAL STREET AND GREEN STREET	3	STBG	\$2,912,907	\$2,912,907	\$2,330,326	\$582,581	Construction; STBG; FFY 2025
Section 2A / State Prioritized Reliability Projects								\$3,125,053	\$2,500,042	\$625,011	
Non-Interstate Pavement								\$3,125,053	\$2,500,042	\$625,011	
2025	610731	Montachusett	Multiple	FITCHBURG- LEOMINSTER- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	3	NHPP	\$3,125,053	\$3,125,053	\$2,500,042	\$625,011	

FFY 2021 Transit Element

Transportation Improvement Program (TIP)
Project List (FY2021)

FTA Program	Project Number	Transit Agency	FTA Activity Line Item	Project Description	Carryover (unobligated)	Federal Funds	State Funds	TDC	Local Funds	Total Cost
5307										
	5307	RTD0009048	Montachusett Regional Transit Authority	114220	New Automatic Passenger Counters (45)		\$160,000	\$40,000	\$0	\$200,000
	5307	RTD0008827	Montachusett Regional Transit Authority	113403	Rehab Fitchburg Intermodal Center		\$40,000	\$10,000	\$0	\$50,000
	5307	RTD0009055	Montachusett Regional Transit Authority	114403	Rehab Fitchburg Admin/Maintenance Facility - Stairs		\$8,000	\$2,000	\$0	\$10,000
	5307	RTD0008830	Montachusett Regional Transit Authority	114220	Replace/Upgrade IT Related Support Equipment		\$200,000	\$50,000	\$0	\$250,000
	5307	RTD0009171	Montachusett Regional Transit Authority	114211	ACQUIRE - SUPPORT VEHICLES		\$28,000	\$7,000	\$0	\$35,000
	5307	RTD0009052	Montachusett Regional Transit Authority	114403	Rehab Fitchburg Admin/Maintenance Facility - Pavement		\$36,000	\$9,000	\$0	\$45,000
	5307	RTD0008831	Montachusett Regional Transit Authority	111215	Buy Replacement Cutaways (5)		\$272,000	\$68,000	\$0	\$340,000
	5307	RTD0009057	Montachusett Regional Transit Authority	114403	Rehab Fitchburg Admin/Maintenance Facility - Fire Safety		\$28,000	\$7,000	\$0	\$35,000
	5307	RTD0008828	Montachusett Regional Transit Authority	117C00	ADA Operating Assistance		\$300,000	\$75,000	\$0	\$375,000
	5307	RTD0009054	Montachusett Regional Transit Authority	111402	Replacement Engines on 35' Buses (2)		\$40,000	\$10,000	\$0	\$50,000
	5307	RTD0007936	Montachusett Regional Transit Authority	114403	Rehab of Fitchburg Admin/Maintenance Facility		\$140,000	\$35,000	\$0	\$175,000
	5307	RTD0009051	Montachusett Regional Transit Authority	114402	Rehab Gardner Maintenance Facility		\$16,000	\$4,000	\$0	\$20,000
	5307	RTD0008834	Montachusett Regional Transit Authority	114401	Rehab Leominster Admin/Storage Facility		\$120,000	\$30,000	\$0	\$150,000
	5307	RTD0008829	Montachusett Regional Transit Authority	300901	50/50 Federal Operating Assistance		\$2,100,000	\$2,100,000	\$0	\$4,200,000
Subtotal							\$3,488,000	\$2,447,000	\$0	\$5,935,000
5309										
Subtotal							\$0	\$0	\$0	\$0
5310										
Subtotal							\$0	\$0	\$0	\$0
5311										
Subtotal							\$0	\$0	\$0	\$0
5337										
Subtotal							\$0	\$0	\$0	\$0
5339										
	5339	RTD0009094	Montachusett Regional Transit Authority	111204	Buy Replacement CDL Mini-buses (3)		\$300,000	\$75,000	\$0	\$375,000
	5339	RTD0009170	Montachusett Regional Transit Authority	111204	Buy Replacement Size C Low-floor Cutaways (5)		\$452,000	\$113,000	\$0	\$565,000
Subtotal							\$752,000	\$188,000	\$0	\$940,000
5320										
Subtotal							\$0	\$0	\$0	\$0
Other Federal										
Subtotal							\$0	\$0	\$0	\$0
Other Non-Federal										
Subtotal							\$0	\$0	\$0	\$0
Total							\$4,240,000	\$2,635,000	\$0	\$6,875,000

Funds listed under the Carry Over column are included in the Federal Amount

FFY 2022 Transit Element

Transportation Improvement Program (TIP)

Project List (FY2022)

FTA Program	Project Number	Transit Agency	FTA Activity Line Item	Project Description	Carryover (unobligated)	Federal Funds	State Funds	TDC	Local Funds	Total Cost
5307										
5307	RTD0008833	Montachusett Regional Transit Authority	119202	PURCHASE BUS SHELTERS		\$16,000	\$4,000	\$0	\$0	\$20,000
5307	RTD0008835	Montachusett Regional Transit Authority	111215	Buy Replacement Cutaways (5)		\$276,000	\$69,000	\$0	\$0	\$345,000
5307	RTD0008836	Montachusett Regional Transit Authority	114220	Replace/Upgrade IT Related Support Equipment		\$68,000	\$17,000	\$0	\$0	\$85,000
5307	RTD0008837	Montachusett Regional Transit Authority	114401	Rehab Leominster Admin/Storage Facility		\$200,000	\$50,000	\$0	\$0	\$250,000
5307	RTD0008841	Montachusett Regional Transit Authority	300901	50/50 Federal Operating Assistance		\$2,100,000	\$2,100,000	\$0	\$0	\$4,200,000
5307	RTD0008842	Montachusett Regional Transit Authority	117C00	ADA Operating Assistance		\$300,000	\$75,000	\$0	\$0	\$375,000
5307	RTD0008847	Montachusett Regional Transit Authority	119401	Rehab Historic Transit Bldg - Athol Depot		\$24,000	\$6,000	\$0	\$0	\$30,000
5307	RTD0009061	Montachusett Regional Transit Authority	113403	Rehab Fitchburg Intermodal Center		\$360,000	\$90,000	\$0	\$0	\$450,000
5307	RTD0008838	Montachusett Regional Transit Authority	111204	Buy Replacement Size C Low-floor Cutaways (3)		\$272,000	\$68,000	\$0	\$0	\$340,000
Subtotal						\$3,616,000	\$2,479,000	\$0	\$0	\$6,095,000
5309										
Subtotal						\$0	\$0	\$0	\$0	\$0
5310										
Subtotal						\$0	\$0	\$0	\$0	\$0
5311										
Subtotal						\$0	\$0	\$0	\$0	\$0
5337										
Subtotal						\$0	\$0	\$0	\$0	\$0
5339										
Subtotal						\$0	\$0	\$0	\$0	\$0
5320										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Non-Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Total						\$3,616,000	\$2,479,000	\$0	\$0	\$6,095,000

Funds listed under the Carry Over column are included in the Federal Amount

FFY 2023 Transit Element

Transportation Improvement Program (TIP)

Project List (FY2023)

FTA Program	Project Number	Transit Agency	FTA Activity Line Item	Project Description	Carryover (unobligated)	Federal Funds	State Funds	TDC	Local Funds	Total Cost
5307										
5307	RTD0008839	Montachusett Regional Transit Authority	111215	Buy Replacement Cutaways (5)		\$280,000	\$70,000	\$0	\$0	\$350,000
5307	RTD0008840	Montachusett Regional Transit Authority	114401	Rehab 150 Main St Administrative Facility		\$40,000	\$10,000	\$0	\$0	\$50,000
5307	RTD0008843	Montachusett Regional Transit Authority	300901	50/50 Federal Operating Assistance		\$2,100,000	\$2,100,000	\$0	\$0	\$4,200,000
5307	RTD0008844	Montachusett Regional Transit Authority	117C00	ADA Operating Assistance		\$300,000	\$75,000	\$0	\$0	\$375,000
5307	RTD0008846	Montachusett Regional Transit Authority	113404	Rehab Fitchburg & Leominster Parking Garages		\$200,000	\$50,000	\$0	\$0	\$250,000
5307	RTD0008848	Montachusett Regional Transit Authority	114420	Replace/Upgrade IT Related Support Equipment		\$100,000	\$25,000	\$0	\$0	\$125,000
5307	RTD0009064	Montachusett Regional Transit Authority	114403	Rehab Fitchburg Admin/Maintenance Facility - Carey St.		\$520,000	\$130,000	\$0	\$0	\$650,000
5307	RTD0007954	Montachusett Regional Transit Authority	113404	Rehab Fitchburg Parking Garage		\$40,000	\$10,000	\$0	\$0	\$50,000
Subtotal						\$3,580,000	\$2,470,000	\$0	\$0	\$6,050,000
5309										
Subtotal						\$0	\$0	\$0	\$0	\$0
5310										
Subtotal						\$0	\$0	\$0	\$0	\$0
5311										
Subtotal						\$0	\$0	\$0	\$0	\$0
5337										
Subtotal						\$0	\$0	\$0	\$0	\$0
5339										
Subtotal						\$0	\$0	\$0	\$0	\$0
5320										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Non-Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Total						\$3,580,000	\$2,470,000	\$0	\$0	\$6,050,000

Funds listed under the Carry Over column are included in the Federal Amount

FFY 2024 Transit Element

Transportation Improvement Program (TIP)
Project List (FY2024)

FTA Program	Project Number	Transit Agency	FTA Activity Line Item	Project Description	Carryover (unobligated)	Federal Funds	State Funds	TDC	Local Funds	Total Cost
5307										
5307	RTD0008849	Montachusett Regional Transit Authority	117C00	ADA Operating Assistance		\$300,000	\$62,500	\$0	\$0	\$362,500
5307	RTD0008850	Montachusett Regional Transit Authority	300901	50/50 Federal Operating Assistance		\$2,100,000	\$2,100,000	\$0	\$0	\$4,200,000
5307	RTD0008851	Montachusett Regional Transit Authority	111215	Buy Replacement Cutaways (5)		\$284,000	\$71,000	\$0	\$0	\$355,000
5307	RTD0008852	Montachusett Regional Transit Authority	114420	Replace/Upgrade IT Related Support Equipment		\$120,000	\$30,000	\$0	\$0	\$150,000
5307	RTD0008086	Montachusett Regional Transit Authority	114403	Rehab Fitchburg Admin/Maintenance Facility		\$80,000	\$20,000	\$0	\$0	\$100,000
5307	RTD0008856	Montachusett Regional Transit Authority	111204	Buy Replacement Size C Low-floor Cutaways (2)		\$180,000	\$45,000	\$0	\$0	\$225,000
5307	RTD0008855*	Montachusett Regional Transit Authority	111203	Buy Replacement 30ft Bus (3)		\$360,000	\$0	\$0	\$0	\$360,000
Subtotal						\$3,424,000	\$2,328,500	\$0	\$0	\$5,752,500
5309										
Subtotal						\$0	\$0	\$0	\$0	\$0
5310										
Subtotal						\$0	\$0	\$0	\$0	\$0
5311										
Subtotal						\$0	\$0	\$0	\$0	\$0
5337										
Subtotal						\$0	\$0	\$0	\$0	\$0
5339										
5339	RTD0008855*	Montachusett Regional Transit Authority	111203	Buy Replacement 30ft Bus (3)		\$720,000	\$270,000	\$0	\$0	\$990,000
Subtotal						\$720,000	\$270,000	\$0	\$0	\$990,000
5320										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Non-Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Total						\$3,784,000	\$2,598,500	\$0	\$0	\$6,742,500

Funds listed under the Carry Over column are included in the Federal Amount

* Project # RTD0008855 is listed under both 5307 and 5339 Programs

FFY 2025 Transit Element

Transportation Improvement Program (TIP)
Project List (FY2025)

FTA Program	Project Number	Transit Agency	FTA Activity Line Item	Project Description	Carryover (unobligated)	Federal Funds	State Funds	TDC	Local Funds	Total Cost
5307										
	5307	RTD0008085	Montachusett Regional Transit Authority	119401	Rehab Historic Transit Bldg - Athol Depot		\$240,000	\$60,000	\$0	\$300,000
	5307	RTD0009065	Montachusett Regional Transit Authority	300901	50/50 Federal Operating Assistance		\$2,100,000	\$2,100,000	\$0	\$4,200,000
	5307	RTD0009066	Montachusett Regional Transit Authority	117C00	ADA Operating Assistance		\$300,000	\$75,000	\$0	\$375,000
	5307	RTD0009067	Montachusett Regional Transit Authority	111215	Buy Replacement Cutaways (5)		\$288,000	\$72,000	\$0	\$360,000
	5307	RTD0009068	Montachusett Regional Transit Authority	111204	Buy Replacement Mini-buses (2)		\$200,000	\$50,000	\$0	\$250,000
	5307	RTD0009069	Montachusett Regional Transit Authority	114420	Replace/Upgrade IT Related Support Equipment		\$64,000	\$16,000	\$0	\$80,000
	5307	RTD0009070	Montachusett Regional Transit Authority	114404	Rehab Leominster Admin/Storage Facility		\$200,000	\$50,000	\$0	\$250,000
	5307	RTD0009071	Montachusett Regional Transit Authority	113404	Rehab Fitchburg Parking Garage		\$200,000	\$50,000	\$0	\$250,000
	5307	RTD0009072	Montachusett Regional Transit Authority	113404	Rehab Ayer Parking Garage		\$16,000	\$4,000	\$0	\$20,000
	5307	RTD0009073	Montachusett Regional Transit Authority	114402	Rehab Gardner Maintenance Facility		\$64,000	\$16,000	\$0	\$80,000
Subtotal						\$3,672,000	\$2,493,000	\$0	\$0	\$6,165,000
5309										
Subtotal						\$0	\$0	\$0	\$0	\$0
5310										
Subtotal						\$0	\$0	\$0	\$0	\$0
5311										
Subtotal						\$0	\$0	\$0	\$0	\$0
5337										
Subtotal						\$0	\$0	\$0	\$0	\$0
5339										
Subtotal						\$0	\$0	\$0	\$0	\$0
5320										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Other Non-Federal										
Subtotal						\$0	\$0	\$0	\$0	\$0
Total						\$3,672,000	\$2,493,000	\$0	\$0	\$6,165,000

Funds listed under the Carry Over column are included in the Federal Amount

FFY 2021 - 2025 MONTACHUSETT TIP PROJECT LIST

ADVANCED CONSTRUCTION CONVERSION CHART

LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022

TOTAL COST (NOT FEDERAL FUNDS)

File #	FUNDING CATEGORY	FFY 21	FFY 22	FFY 23	FFY 24	FFY 25	TOTAL
604499	CMAQ			\$284,044	\$1,183,517	\$110,462	\$1,578,023
	HSIP			\$206,578	\$860,740	\$80,336	\$1,147,654
	STBG			\$2,065,776	\$8,607,399	\$803,357	\$11,476,532
	TAP			\$25,822	\$107,592	\$10,042	\$143,456
FISCAL YEAR FEDERAL AID TOTALS:		\$0	\$0	\$2,298,176	\$9,575,731	\$893,735	\$12,767,642

APPENDIX A – REGIONAL PRIORITIES FOR WHICH FUNDING HAS NOT BEEN IDENTIFIED

(For Informational Purposes)

Please note that the projects listed represent the best available information at the time of compilation. Actual implementation is subject to right of way, design, land taking, local action and/or other issues that could delay project time frames and subsequently advertising and award date

MassDOT ID #	Municipality	Description	MassDOT District	TEC Score	Total Est. Cost
609213	Harvard	HARVARD- RESURFACING AND BOX WIDENING ON AYER ROAD, FROM ROUTE 2 TO THE AYER TOWN LINE	3	32	\$5,520,000
608415	Athol	ATHOL- INTERSECTION IMPROVEMENTS AT ROUTE 2A AND BROOKSIDE ROAD	2	30	\$1,544,720
608723	Athol	ATHOL- INTERSECTION IMPROVEMENTS AT CRESCENT STREET AND CHESTNUT HILL AVENUE	2	30	\$5,215,807
606640	Ayer	AYER- RESURFACING & RELATED WORK ON ROUTE 2A (FITCHBURG ROAD & PARK STREET)	3	25	\$2,400,000
608832	Lancaster	LANCASTER- INTERCHANGE IMPROVEMENTS AT ROUTE 2 EXIT 34 (OLD UNION TURNPIKE)	3	23	\$6,060,800
609227	Ayer	AYER- ROADWAY REHABILITATION ON ROUTE 2A/111 (PARK STREET AND MAIN STREET)	3	23	\$4,800,000
608177	Ashby	ASHBY- TOWNSEND- RECONSTRUCTION OF ROUTE 119 FROM WHEELER ROAD TO ROUTE 31	3	21	\$6,727,500
608424	Templeton	TEMPLETON- RECONSTRUCTION OF ROUTE 68, FROM KING PHILLIP TRAIL (ROUTE 202) NORTH TO THE PHILLIPSTON TOWN LINE (2.65 MILES)	2	18	\$5,967,274
608879	Winchendon	WINCHENDON- RESURFACING & RELATED WORK ON MAPLE STREET (ROUTE 202), FROM VINE STREET TO GLENALLEN STREET (1.36 MILES)	2	15	\$1,680,444
607604	Sterling- West Boylston	STERLING- WEST BOYLSTON- IMPROVEMENTS ON ROUTE 140 AT I-190	3	14	\$3,647,110
608443	Littleton/Ayer	LITTLETON- AYER- INTERSECTION IMPROVEMENTS ON ROUTE 2A AT WILLOW ROAD AND BRUCE STREET	3	NA	\$2,400,000

APPENDIX B – MONTACHUSETT MPO TRANSPORTATION EVALUATION CRITERIA

Montachusett Regional Planning Commission					
TRANSPORTATION EVALUATION CRITERIA (version 4.0 (2018))					
Community				Info as of:	2/1/2019
MassDOT Project No.			Est Cost:		
Design Status					
Est Ad Date					
Category	Line Item #				Max. Score 66
Condition	1	What is the magnitude of impact to the pavement condition? Based on PCI (MRPC)			0
		Poor to Excellent (4)	<input type="text"/>	(4)	
		Fair to Excellent (3)	<input type="text"/>	(3)	
		Good to Excellent (2)	<input type="text"/>	(2)	
		Excellent to Excellent or No Change (0)	<input type="text"/>	(0)	
	2	What are the impacts of other infrastructure elements, i.e. traffic control devices, roundabouts, other geometric design changes, sidewalks, bike lanes, drainage, utilities, etc?			0
		Traffic Control Devices, Roundabout, other Geometric Changes	<input type="text"/>	(1)	
		Existing Bike/Ped/Sidewalk Upgrades	<input type="text"/>	(1)	
		Drainage (Culverts & Sewers)	<input type="text"/>	(1)	
		Utilities	<input type="text"/>	(1)	
	3	What is the Average Daily Traffic (ADT) of the Road and/or Intersection			0
		Rural	Less than 1,000 ADT (1)	<input type="text"/>	(1 to 4)
			1,001 to 2,000 ADT (2)		
			2,001 to 5,000 ADT (3)		
			Greater than 5,000 ADT (4)		
		Urban	Less than 5,000 ADT (1)	<input type="text"/>	(1 to 4)
			5,001 to 10,000 ADT (2)		
			10,001 to 15,000 ADT (3)		
			Greater than 15,000 ADT (4)		
	4	Does the project incorporate Complete Street concepts?			0
		Yes/NEW Shared Bike/Ped/Vehicle Elements	<input type="text"/>	(1)	
		Yes/New Separate Bike Elements	<input type="text"/>	(1)	
		Yes/New Separate Ped Elements	<input type="text"/>	(1)	

Mobility	5 Does the project have an impact to any known congestion issue?			0
	Roadway Congestion	<input type="text"/>	(1)	
	Intersection Congestion	<input type="text"/>	(1)	
	6 Does the project have an impact to regional travel time and/or connectivity to the regional roadway network?			0
	Reduction in Travel Time	<input type="text"/>	(1)	
	Improve Network Connectivity	<input type="text"/>	(1)	
	7 Does the project have an impact to any other mode such as transit, that utilize the facility?			0
	Transit Service Impact - Fixed Route	<input type="text"/>	(1)	
	Transit Service Impact - Other	<input type="text"/>	(1)	
	8 Does the project promote reductions in SOV (single occupant vehicles)?			0
	Park & Ride Lot Construction (0 to 1)	<input type="text"/>	(1)	
	Park & Ride Lot Access (0 to 1)	<input type="text"/>	(1)	
Transit Facility Access (0 to 1)	<input type="text"/>	(1)		
Other (0 to 1)	<input type="text"/>	(1)		

Safety	9 Does the project address a known safety issue on a facility that is on the Region's Top 5% Crash Locations list?			0
	Yes - Top 1%	<input type="text"/>	(5)	
	Yes - Top 2% to 3%	<input type="text"/>	(3)	
	Yes - Top 4% to 5%	<input type="text"/>	(1)	
	10 Does the project have an effect on the crash rate and/or the crash severity of the facility?			0
	Crash Rate Yes	<input type="text"/>	(1)	
	No	<input type="text"/>	(0)	
	Crash Severity Yes	<input type="text"/>	(1)	
	No	<input type="text"/>	(0)	
	11 Does the project have an effect on bicycle or pedestrian safety on the facility?			0
	Yes	<input type="text"/>	(1)	
	No	<input type="text"/>	(0)	
12 Is the facility within the state's Top 200 Intersection Locations for Crashes?			0	
Yes - Locations 1 to 50	<input type="text"/>	(5)		
Yes - Locations 51 to 100	<input type="text"/>	(3)		
Yes - Locations 101 to 200	<input type="text"/>	(1)		

Community Effects and Support	13	Is there any impact or change (positive or negative) to residential areas or neighborhoods related to noise, aesthetics, cut-through traffic, or the development/redevelopment of any housing stock?		0
		Noise/aesthetics	<input type="text"/> (-1 to 1)	
		Traffic flow	<input type="text"/> (-1 to 1)	
		Housing stock	<input type="text"/> (-1 to 1)	
	14	Does the project have an effect (positive or negative) on any services (i.e. transit, infrastructure, utilities, jobs, etc.) to Title VI or Environmental Justice populations as defined by either FHWA or FTA ?		0
		Title VI Populations Yes	<input type="text"/> (-1 to 1)	
		EJ Populations Yes	<input type="text"/> (-1 to 1)	
	15	Is there support for the project from local, regional, legislative governments and the general public?		0
		Local governments	<input type="text"/> (1)	
		Multiple Local governments	<input type="text"/> (1)	
		Legislative government	<input type="text"/> (1)	
		General public	<input type="text"/> (1)	
	16	Is there active participation from the community in the MPO, MRPC and MJTC?		0
		MPO	<input type="text"/> (1)	
		MRPC	<input type="text"/> (1)	
		MJTC	<input type="text"/> (2)	

Land Use and Economic Development	17	Is there any impact or change (positive or negative) to business (commercial and/or industrial) areas related to general access, noise, traffic, parking, or freight?		0
		General Access	<input type="text"/> (-1 to +1)	
		Noise/Aesthetics	<input type="text"/> (-1 to +1)	
		Traffic Flow/Parking	<input type="text"/> (-1 to +1)	
		Freight Access	<input type="text"/> (-1 to +1)	
	18	Is the project in conformance with local concepts and plans?		0
		Yes	<input type="text"/> (1)	
	19	If Yes, is the project specifically identified in the plan?		0
		Yes	<input type="text"/> (1)	
	20	Does the project have any effect on job creation or job access?		0
		Job Creation Yes	<input type="text"/> (1)	
		Job Access Yes	<input type="text"/> (1)	
	21	Is the project part of or located on any transportation security or evacuation route or provide access to any major emergency facility?		0
		Local evacuation route	<input type="text"/> (1)	
		Regional evacuation route	<input type="text"/> (1)	
		Access to emergency facilities	<input type="text"/> (1)	

Environmental Effects	22 Does the project have an impact (positive or negative) on Air Quality, Climate standards and/or Green House Gas (GHG) emissions?			0
	Positive/Negative/None	<input type="text"/>	(-1 to 1)	
	23 Does the project have an impact (positive or negative) on water quality, supply or wetlands?			0
	Positive/Negative/None	<input type="text"/>	(-1 to 1)	
	24 Does the project have an impact (positive or negative) on historic and/or cultural resources?			0
	Positive/Negative/None	<input type="text"/>	(-1 to 1)	
	25 Does the project have an impact (positive or negative) on wildlife habitats and/or endangered species?			0
	Positive/Negative/None	<input type="text"/>	(-1 to 1)	
	26 Is the Resiliency of the facility improved or hindered by the project?			0
	Positive/Negative/None	<input type="text"/>	(-1 to 1)	
Total TEC Score				0

APPENDIX C – 2021 – 2025 TIP GREENHOUSE GAS MONITORING AND EVALUATION

Introduction

This section summarizes the greenhouse gas (GHG) impacts anticipated to result from the projects that are included in this FFY 2021 – 2025 TIP. It includes a summary of the state laws and policies that call for reducing greenhouse gas in order to mitigate global climate change; actions that respond to these state laws and policies; the role of regional planning and TIP development in reducing GHG emission and tracking these reductions; and the projected GHG emission impacts from the projects programmed in the TIP.

State policy context

The Global Warming Solutions Act (GWSA), which was signed into law in August 2008, makes Massachusetts a leader in setting aggressive and enforceable GHG reduction targets, and implementing policies and initiatives to achieve these targets. In keeping with the law, on December 29, 2010 the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), in consultation with other state agencies and the public, released the Massachusetts Clean Energy and Climate Plan for 2020. In December 2014, DEP issued new regulations that require MPOs to quantify impacts from project investments, track progress towards reductions, and consider impacts in the prioritization of project investments. The targets for overall statewide GHG emissions are:



The role of MPOs

The Commonwealth's MPOs are integrally involved in supporting the GHG reductions mandated under the GWSA. The MPOs are most directly involved in helping to achieve the GHG emissions reductions through the promotion of healthy transportation modes through prioritizing and programming an appropriate balance of roadway, transit, bicycle and pedestrian investments – and assisting smart growth development patterns through the creation of a balanced multi-modal transportation system. This is realized through the transportation goals and policies espoused in the 2016 Regional Transportation Plans (RTPs); the major projects planned in those RTPs; and the mix of new transportation projects that are programmed and implemented through the TIPs. GHG tracking and evaluation processes enable the MPOs to identify anticipated GHG impacts of planned and programmed projects, and also to use GHG impacts as a criterion in prioritizing transportation projects.

Project-level GHG tracking and evaluation in TIPs

It is also important to monitor and evaluate the GHG impacts of the transportation projects that are programmed in the MPOs' TIPs. The TIPs include both the larger, regionally-significant projects from the RTPs, which are reported in the Statewide GHG report, as well as smaller projects that are not included in the RTP but that may nevertheless have impacts on GHG emissions. The primary objective of this tracking is to enable the MPOs to evaluate expected GHG impacts of different projects and to use this information as a criterion for prioritizing and programming projects.

Calculation of GHG Impacts for TIP Projects

MassDOT has adopted spreadsheets used by MPOs to determine CMAQ eligibility and that also include CO₂ impacts. The data and analysis required for these calculations is available from functional design reports that are submitted for projects that would produce a measurable GHG impact.

Calculation of GHG Impacts for TIP Projects

The Office of Transportation Planning at MassDOT provided the spreadsheets that are used for determining Congestion Management and Air Quality Improvement (CMAQ) eligibility. These spreadsheets require the same inputs as the CMAQ calculations and have been adapted to provide CO₂ impacts. The data and analysis required for these calculations is available from functional design reports that should be submitted for projects that would produce a measurable GHG impact.

- Projects with Quantified Impacts
 - RTP Projects - Major capacity expansion projects would be expected to have a significant impact on GHG emissions. However, these projects are included in the RTPs and analyzed using the statewide model or Boston regional model, which would reflect their GHG impacts. Therefore, no independent TIP calculations are required.
 - Quantified Decrease in Emissions - Projects that would be expected to produce a measurable decrease in emissions. The approach for calculating these impacts is described below. These projects should be categorized in the following manner:
 - Quantified Decrease in Emissions from Traffic Operational Improvement - An intersection reconstruction or signalization project that is projected to reduce delay and congestion.
 - Quantified Decrease in Emissions from Pedestrian and Bicycle Infrastructure - A shared-use path that would enable increased walking and biking and decreased vehicle-miles traveled (VMT).
 - Quantified Decrease in Emissions from New/Additional Transit Service - A bus or shuttle service that would enable increased transit ridership and decreased VMT
 - Quantified Decrease in Emissions from a Park and Ride Lot A park-and-ride lot that would enable increased transit ridership/ increased ridesharing and decreased VMT
 - Quantified Decrease in Emissions from Bus Replacement - A bus replacement that would directly reduce GHG emissions generated by that bus service.
 - Quantified Decrease in Emissions from Complete Streets Improvements - Improvements to roadway networks that include the addition of bicycle and pedestrian accommodations where none were present before.
 - Quantified Decrease in Emissions from Other Improvement
 - Quantified Increase in Emissions – Projects that would be expected to produce a measurable increase in emissions.
- Projects with Assumed Impacts
 - No Assumed Impact/Negligible Impact on Emission - Projects that do not change the capacity or use of a facility (e.g. a resurfacing project that restores a roadway to its previous condition, or a bridge rehabilitation/replacement that restores the bridge to its previous condition) would be assumed to have no GHG impact.
 - Assumed Nominal Decrease in Emissions - Projects that would be expected to produce a minor decrease in emissions that cannot be calculated with any precision. Examples of such projects include roadway repaving or reconstruction projects that add a new sidewalk or new bike lanes. Such a project would enable increased travel by walking or bicycling, but there may be not data or analysis to support any projections of GHG impacts. These projects should be categorized in the following manner:
 - Assumed Nominal Decrease in Emissions from Sidewalk Infrastructure
 - Assumed Nominal Decrease in Emissions from Bicycle Infrastructure
 - Assumed Nominal Decrease in Emissions from Sidewalk and Bicycle Infrastructure
 - Assumed Nominal Decrease in Emissions from Intelligent Transportation Systems (ITS) and/or Traffic Operational Improvements
 - Assumed Nominal Decrease in Emissions from Other Improvements
 - Assumed Nominal Increase in Emissions - Projects that would be expected to produce a minor increase in emissions that cannot be calculated with any precision.

Regional Greenhouse Gas Impact Summary Tables for FFY 2021 – 2025 TIP

The following tables summarize the calculated quantitative and assumed qualitative impacts of the projects included in the regional FFY 2021 – 2025 TIP.

Highway Projects with GHG Emissions Analysis

2021 Regional Project Tracking

MassDOT Project ID	MassDOT Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Change in Summer CO2 Emissions (kilograms/year)
608548	WINCHENDON- IMPROVEMENTS & RELATED WORK ON CENTRAL STREET (ROUTE 202), FROM FRONT STREET TO MAPLE STREET (0.5 MILES)	Qualitative	Qualitative Decrease in Emissions	N/A
607431	WESTMINSTER- RESURFACING & RELATED WORK ON ROUTE 140, FROM ROUTE 2A TO PATRICIA ROAD	Qualitative	Qualitative Decrease in Emissions	N/A
608888	GARDNER - RECLAMATION AND RELATED WORK ON PEARSON BOULEVARD	Qualitative	Qualitative Decrease in Emissions	N/A
608891	GARDNER- RESURFACING AND RUMBLE STRIP INSTALLATION ON ROUTE 140	Qualitative	Qualitative Decrease in Emissions	N/A
608657	LUNENBURG- BRIDGE REHABILITATION, L-17-009, ROUTE 2A OVER PEARL HILL BROOK	Qualitative	No assumed impact/negligible impact on emissions	N/A
608561	LEOMINSTER- IMPROVEMENTS AT ROUTE 12 (NORTH MAIN STREET) AT HAMILTON STREET; ROUTE 12 (NORTH MAIN STREET) AT NELSON STREET	Qualitative	Qualitative Decrease in Emissions	N/A
609411	FITCHBURG- LEOMINSTER- RAIL TRAIL CONSTRUCTION (TWIN CITIES RAIL TRAIL)	Quantified	Quantified Decrease in Emissions from Bicycle and Pedestrian Infrastructure	407,831
TOTAL				407,831

2022 Regional Project Tracking

MassDOT Project ID	MassDOT Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Change in Summer CO2 Emissions (kilograms/year)
608779	LANCASTER - INTERSECTION IMPROVEMENTS ON ROUTE 117/ROUTE 70 AT LUNENBURG ROAD AND ROUTE 117/ROUTE 70 AT MAIN STREET	Quantified	Quantified Decrease in Emissions from Traffic Operational Improvement	658,914
608793	HUBBARDSTON - HIGHWAY RECONSTRUCTION OF ROUTE 68 (MAIN STREET), FROM 1,000 FT NORTH OF WILLIAMSVILLE ROAD TO ELM STREET	Qualitative	Qualitative Decrease in Emissions	N/A
605296	FITCHBURG- BRIDGE PRESERVATION, F-04-011, CIRCLE STREET OVER NORTH NASHUA RIVER	Qualitative	No assumed impact/negligible impact on emissions	N/A
608850	PETERSHAM- BRIDGE REPLACEMENT, P-08-002, GLEN VALLEY ROAD OVER EAST BRANCH OF SWIFT RIVER	Qualitative	No assumed impact/negligible impact on emissions	N/A
609314	ASHBY- INTERSECTION IMPROVEMENTS AT GREENVILLE ROAD (ROUTE 31) AND TURNPIKE ROAD	Qualitative	Qualitative Decrease in Emissions	N/A
609529	LEOMINSTER- VISCOLOID AVENUE IMPROVEMENTS (SRTS)	Qualitative	Qualitative Decrease in Emissions	N/A
610672	GARDNER- ELM STREET RESURFACING AND SIDEWALK IMPROVEMENTS - SRTS	Qualitative	Qualitative Decrease in Emissions	N/A
			TOTAL	658,914

2023 Regional Project Tracking

MassDOT Project ID	MassDOT Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Change in Summer CO2 Emissions (kilograms/year)
604499	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	Quantified	Quantified Decrease in Emissions from Bicycle and Pedestrian Infrastructure	41989*
608784	TEMPLETON- ROUNDABOUT CONSTRUCTION AT THE INTERSECTION OF PATRIOTS ROAD, SOUTH MAIN STREET, NORTH MAIN STREET AND GARDNER ROAD	Qualitative	Qualitative Decrease in Emissions	N/A
607432	WESTMINSTER- REHABILITATION & BOX WIDENING ON ROUTE 140, FROM PATRICIA ROAD TO THE PRINCETON T.L.	Qualitative	Qualitative Decrease in Emissions	N/A
608189	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	Qualitative	No assumed impact/negligible impact on emissions	N/A
609108	GARDNER- BIKE PATH BRIDGE CONSTRUCTION, NORTH CENTRAL PATHWAY OVER ROUTE 140	Qualitative	Qualitative Decrease in Emissions	More Information Needed
609187	HUBBARDSTON- BRIDGE REPLACEMENT, H-24-003, WILLIAMSVILLE ROAD OVER THE BURNSHIRT BROOK	Qualitative	No assumed impact/negligible impact on emissions	N/A
* Project AC'd in 2023, 2024 & 2025 (Total reflected in 2025)			TOTAL	N/A

2024 Regional Project Tracking

MassDOT Project ID	MassDOT Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Change in Summer CO2 Emissions (kilograms/year)
604499	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	Quantified	Quantified Decrease in Emissions from Bicycle and Pedestrian Infrastructure	41989*
609107	PHILLIPSTON- TEMPLETON- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	Qualitative	Qualitative Decrease in Emissions	N/A
610729	GARDNER- WESTMINSTER- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	Qualitative	Qualitative Decrease in Emissions	N/A
610730	WESTMINSTER- FITCHBURG- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	Qualitative	Qualitative Decrease in Emissions	N/A
* Project AC'd in 2023, 2024 & 2025 (Total reflected in 2025)			TOTAL	N/A

2025 Regional Project Tracking

MassDOT Project ID	MassDOT Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Change in Summer CO2 Emissions (kilograms/year)
604499	LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022	Quantified	Quantified Decrease in Emissions from Bicycle and Pedestrian Infrastructure	41989*
601957	ASHBURNHAM - RESURFACING & RELATED WORK ON ROUTE 101	Qualitative	Qualitative Decrease in Emissions	N/A
609279	GARDNER- ROUNDABOUT CONSTRUCTION AT ELM STREET, PEARL STREET, CENTRAL STREET AND GREEN STREET	Qualitative	Qualitative Decrease in Emissions	N/A
610731	FITCHBURG- LEOMINSTER- PAVEMENT PRESERVATION AND RELATED WORK ON ROUTE 2	Qualitative	Qualitative Decrease in Emissions	N/A
* Project AC'd in 2023, 2024 & 2025 (Total reflected in 2025)			TOTAL	41,989

Transit Projects with GHG Emissions Analysis

2021 Regional Project Tracking

Project ID	Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Reduction in Summer CO2 Emissions (kilograms/year)
RTD0008831	Buy Replacement Cutaways (5)	Quantified	Quantified Decrease in Emissions from Bus Replacement	28,548.30
RTD0009094	Buy Replacement CDL Mini-buses (3)	Quantified	Quantified Decrease in Emissions from Bus Replacement	20,012.55
TOTAL				48,561

2022 Regional Project Tracking

Project ID	Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Reduction in Summer CO2 Emissions (kilograms/year)
RTD0008835	Buy Replacement Cutaways (5)	Quantified	Quantified Decrease in Emissions from Bus Replacement	28,548.30
RTD0008838	Buy Replacement Size C Low Floor Cutaways (3)	Quantified	Quantified Decrease in Emissions from Bus Replacement	8,114.11
TOTAL				36,662

2023 Regional Project Tracking

Project ID	Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Change in Summer CO2 Emissions (kilograms/year)
RTD0008839	Buy Replacement Cutaways (5)	Quantified	Quantified Decrease in Emissions from Bus Replacement	21,641.07
TOTAL				21,641

2024 Regional Project Tracking

Project ID	Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Reduction in Summer CO2 Emissions (kilograms/year)
RTD0008851	Buy Replacement Cutaways (5)	Quantified	Quantified Decrease in Emissions from Bus Replacement	21,641.07
RTD0008855	Buy Replacement 30' Bus (3)	Quantified	Quantified Decrease in Emissions from Bus Replacement	9,639.30
RTD0008856	Buy Replacement Size C Low Floor Cutaways (2)	Quantified	Quantified Decrease in Emissions from Bus Replacement	4,507.84
			TOTAL	35,788

2025 Regional Project Tracking

Project ID	Project Description	GHG Analysis Type	GHG Impact Description	GHG Impact by the Numbers Reduction in Summer CO2 Emissions (kilograms/year)
RTD0009068	Buy Replacement Cutaways (5)	Quantified	Quantified Decrease in Emissions from Bus Replacement	21,641.07
RTD0009094	Buy Replacement CDL Mini-buses (2)	Quantified	Quantified Decrease in Emissions from Bus Replacement	4,679.30
			TOTAL	26,320

Past Years Highway Projects with GHG Emissions Analysis

Montachusett Region Completed Highway Projects GHG						
MassDOT Project ID ▼	MassDOT Project Description ▼	Total Programmed Funds ▼	GHG Analysis Type ▼	GHG CO ₂ Impact (kg/yr) ▼	GHG Impact Description ▼	Fiscal Year of Contract Award (2016 and forward) ▼
604699	STERLING- INTERSECTION IMPROVEMENTS AT ROUTE 12 AND CHOCKETT ROAD	\$5,633,000	Quantified	130,027.48	Quantified Decrease in Emissions from Traffic Operational Improvement	2016
604960	CLINTON- RESURFACING & RELATED WORK ON WATER STREET AND BOLTON ROAD (1.2 MILES)	\$4,433,939	Quantified	12,730.30	Quantified Decrease in Emissions from Traffic Operational Improvement	2016
604928	LEOMINSTER- RECONSTRUCTION OF MECHANIC STREET, FROM LAUREL STREET TO THE LEOMINSTER CONNECTOR	\$2,929,315	Quantified	5,080.06	Quantified Decrease in Emissions from Traffic Operational Improvement	2016
607242	FITCHBURG- SAFE ROUTES TO SCHOOLS (SOUTH STREET ELEMENTARY SCHOOL)	\$1,580,298	Qualitative		No assumed impact/negligible impact on emissions	2016
607529	WINCHENDON- BRIDGE REPLACEMENT, W-39-015, NORTH ROYALSTON RD OVER TARBELL BROOK	\$2,243,868	Qualitative		No assumed impact/negligible impact on emissions	2017
608250	ROYALSTON- BRIDGE REPLACEMENT, R-12-001 (B35), STOCKWELL ROAD OVER LAWRENCE BROOK	\$857,005	Qualitative		No assumed impact/negligible impact on emissions	2017
607475	WINCHENDON- RESURFACING & RELATED WORK ON ROUTE 12, FROM MILL STREET/BEGINNING OF STATE HIGHWAY TO NEW HAMPSHIRE STATE LINE	\$1,571,623	Qualitative		No assumed impact/negligible impact on emissions	2017
608188	GARDNER- LEOMINSTER- STERLING- INTERSECTION IMPROVEMENTS AT 3 LOCATIONS	\$2,269,376	Qualitative		No assumed impact/negligible impact on emissions	2018
606124	FITCHBURG- LUNENBURG- LEOMINSTER- RECONSTRUCTION OF SUMMER STREET AND NORTH STREET	\$9,939,131	Quantified	8.83	Quantified Decrease in Emissions from Traffic Operational Improvement	2018
608179	ROYALSTON- BRIDGE REPLACEMENT, R-12-009, NORTH FITZWILLIAM ROAD OVER LAWRENCE BROOK	\$1,721,880	Qualitative		No Assumed Impact/Negligible Impact on Emissions	2018
605094	FITCHBURG- BRIDGE REPLACEMENT, F-04-003, STATE ROUTE 31 OVER PHILLIPS BROOK	\$3,120,258	Qualitative		No Assumed Impact/Negligible Impact on Emissions	2018
603513	GARDNER- BRIDGE REPLACEMENT, G-01-008, PLEASANT STREET OVER THE B&M RAILROAD	\$4,404,240	Qualitative		No Assumed Impact/Negligible Impact on Emissions	2018
608728	WINCHENDON- RESURFACING & RELATED WORK ON ROUTE 202, FROM THE TEMPLETON TOWN LINE TO MAIN STREET (3.1 MILES)	\$1,596,635	Qualitative		Qualitative Decrease in Emissions	2019
604961	CLINTON- RESURFACING & RELATED WORK ON ROUTE 110 (HIGH STREET)	\$2,436,388	Qualitative		No assumed impact/negligible impact on emissions	2019
607848	HUBBARDSTON - RESURFACING & RELATED WORK ON ROUTE 68, FROM WILLIAMSVILLE ROAD TO THE GARDNER C.L.	\$4,044,376	Qualitative		No assumed impact/negligible impact on emissions	2019
607446	WESTMINSTER- INTERSECTION IMPROVEMENTS, ROUTE 2A AT ROUTE 140	\$2,176,454	Qualitative		Qualitative Decrease in Emissions	2019
605651	LEOMINSTER- RECONSTRUCTION ON ROUTE 13, FROM HAWES STREET TO PROSPECT STREET	\$5,994,626	Quantified	138,448	Quantified Decrease in Emissions from Traffic Operational Improvement	2020
607902	AYER- RECLAMATION & RELATED WORK ON ROUTE 2A, FROM HARVARD ROAD TO MAIN STREET	\$3,837,875	Qualitative		No assumed impact/negligible impact on emissions	2020
608635	SHIRLEY- BRIDGE REPLACEMENT, S-13-005, CARRYING LONGLEY ROAD OVER THE MUPUS BROOK	\$1,548,259	Qualitative		No assumed impact/negligible impact on emissions	2020
608639	WESTMINSTER- BRIDGE REPLACEMENT, W-28-010, CARRYING WHITMANVILLE ROAD OVER THE WHITMAN RIVER	\$2,845,266	Qualitative		No assumed impact/negligible impact on emissions	2020
TBD	ATHOL-PHILLIPSTON - RESURFACING AND RELATED WORK ON ROUTE 2	\$7,995,680	Qualitative		No assumed impact/negligible impact on emissions	2020

Past Years Transit Projects with GHG Emissions Analysis

Montachusett Region Completed Transit Projects GHG								
FTA Activity Line Item	Transit Agency	Project Description	Total Cost	GHG Analysis Type	GHG CO2 Impact (kg/yr)	GHG Impact Description	Additional Description	Fiscal Year Programmed
111215	Montachusett RPA	BUY REPLACEMENT VANS (5)	\$287,500	Qualitative	1,889.92	Qualitative Decrease in Emissions	FFY 2015 5310 Funds -377.983 kg/yr per van	2016
111215	Montachusett RPA	BUY REPLACEMENT VANS (8)	\$242,675	Qualitative	5,442.96	Qualitative Decrease in Emissions	FFY 2016 Other Non-Federal Funds -680.370 kg/yr per van	2016
111204	Montachusett RPA	BUY REPLACEMENT <30 FT BUS (1)	\$62,392	Quantified	45.17	Quantified Decrease in Emissions from Bus Replacement	FFY 2016 Other Non-Federal Funds -45.168 kg/yr per bus	2016
111215	Montachusett RPA	BUY REPLACEMENT VANS (5)	\$295,000	Quantified	2,672.19	Quantified Decrease in Emissions from Bus Replacement	FFY 2017 5307 Funds -534.438 kg/yr per van	2017
111204	Montachusett RPA	BUY REPLACEMENT <30 FT BUS (2)	\$182,500	Quantified	247.21	Quantified Decrease in Emissions from Bus Replacement	FFY 2017 FFY 5339 Funds -123.607 kg/yr per bus	2017
111215	Montachusett RPA	BUY REPLACEMENT VAN (5)	\$306,250	Quantified	36,511.07	Quantified Decrease in Emissions from Bus Replacement	FFY 2018 5307 Funds -7302.213 kg/yr per van	2018
111215	Montachusett RPA	BUY REPLACEMENT VAN (5)	\$284,000	Quantified	36,512.07	Quantified Decrease in Emissions from Bus Replacement	FFY 2018 5307 Funds -7302.213 kg/yr per van	2019
111204	Montachusett RPA	BUY REPLACEMENT <30 FT BUS (3)	\$360,000	Quantified	24,404.78	Quantified Decrease in Emissions from Bus Replacement	FFY 2018 5307 Funds -12360.7 kg/yr per bus	2019
111215	Montachusett RPA	BUY REPLACEMENT VAN (5)	\$290,000	Quantified	33,244.20	Quantified Decrease in Emissions from Bus Replacement	FFY 2018 5307 Funds -6648.44 kg/yr per van	2020
111204	Montachusett RPA	BUY REPLACEMENT <30 FT BUS (3)	\$360,000	Quantified	4,879.10	Quantified Decrease in Emissions from Bus Replacement	FFY 2018 5307 Funds -1626.37 kg/yr per bus	2020

2021 Transit Project GHG Impacts

MassDOT/FTA Project ID ▼	MassDOT/FTA Project Description ▼	Total Programmed Funds ▼	GHG Analysis Type ▼	GHG CO ₂ Impact (kg/yr) ▼	GHG Impact Description ▼	Total Cost ▼	Additional Information ▼	Fiscal Year of Contract Award (2015 and forward) ▼
RTD0009068	Buy Replacement Cutaways (5)	\$ 360,000	Quantified	21641.07375	Quantified Decrease in Emissions from Bus Replacement	\$ 360,000		
RTD0009094	Buy Replacement CDL Mini-buses (2)	\$ 250,000	Quantified	4679.304	Quantified Decrease in Emissions from Bus Replacement	\$ 250,000		

2022 Transit Project GHG Impacts

MassDOT/FTA Project ID ▼	MassDOT/FTA Project Description ▼	Total Programmed Funds ▼	GHG Analysis Type ▼	GHG CO ₂ Impact (kg/yr) ▼	GHG Impact Description ▼	Total Cost ▼	Additional Information ▼	Fiscal Year of Contract Award (2015 and forward) ▼
RTD0008835	Buy Replacement Cutaways (5)	\$ 345,000	Quantified	28548.3015	Quantified Decrease in Emissions from Bus Replacement	\$ 345,000		
RTD0008838	Buy Replacement Size C Low Floor Cutaways (3)	\$ 340,000	Quantified	8114.1102	Quantified Decrease in Emissions from Bus Replacement	\$ 340,000		

2023 Transit Project GHG Impacts

MassDOT/FTA Project ID ▼	MassDOT/FTA Project Description ▼	Total Programmed Funds ▼	GHG Analysis Type ▼	GHG CO ₂ Impact (kg/yr) ▼	GHG Impact Description ▼	Total Cost ▼	Additional Information ▼	Fiscal Year of Contract Award (2015 and forward) ▼
RTD0008839	Buy Replacement Cutaways (5)	\$ 350,000	Quantified	21641.07375	Quantified Decrease in Emissions from Bus Replacement	\$ 350,000		

2024 Transit Project GHG Impacts

MassDOT/FTA Project ID ▼	MassDOT/FTA Project Description ▼	Total Programmed Funds ▼	GHG Analysis Type ▼	GHG CO ₂ Impact (kg/yr) ▼	GHG Impact Description ▼	Total Cost ▼	Additional Information ▼	Fiscal Year of Contract Award (2015 and forward) ▼
RTD0008851	Buy Replacement Cutaways (5)	\$ 355,000	Quantified	21641.07375	Quantified Decrease in Emissions from Bus Replacement	\$ 355,000		
RTD0008855	Buy Replacement 30' Bus (3)	\$ 1,350,000	Quantified	9639.3	Quantified Decrease in Emissions from Bus Replacement	\$ 1,350,000		
RTD0008856	Buy Replacement Size C Low Floor Cutaways (2)	\$ 225,000	Quantified	4507.839	Quantified Decrease in Emissions from Bus Replacement	\$ 225,000		

2025 Transit Project GHG Impacts

MassDOT/FTA Project ID ▼	MassDOT/FTA Project Description ▼	Total Programmed Funds ▼	GHG Analysis Type ▼	GHG CO ₂ Impact (kg/yr) ▼	GHG Impact Description ▼	Total Cost ▼	Additional Information ▼	Fiscal Year of Contract Award (2015 and forward) ▼
RTD0009068	Buy Replacement Cutaways (5)	\$ 360,000	Quantified	21641.07375	Quantified Decrease in Emissions from Bus Replacement	\$ 360,000		
RTD0009094	Buy Replacement CDL Mini-buses (2)	\$ 250,000	Quantified	4679.304	Quantified Decrease in Emissions from Bus Replacement	\$ 250,000		

EMISSIONS ANALYSIS

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2021** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0008831; Buy Replacement Cutaways (5)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2010	0.029	0.108	3.703	619.740
New Bus Purchase**	=	2021	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.026	-0.083	-3.111	-183.886
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
135,000	1.15	155,250	302	514

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.026	1,000	514	1.0188	-0.014
Change in Summer NOx	-0.083	1,000	514	1.0188	-0.043
Change in Winter CO	-3.111	1,000	514	0.9812	-1.569
Change in Summer CO2	-183.886	1,000	514	1.0000	-94.531

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.014	302	-4.086
Summer NOx	-0.043	302	-13.102
Winter CO	-1.569	302	-473.849
Summer CO2	-94.531	302	-28548.302

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$340,000	12	4.086	\$6,933
Summer NOx	\$340,000	12	13.102	\$2,163
Winter CO	\$340,000	12	473.849	\$60
Summer CO2	\$340,000	12	28548.302	\$1

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2021** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0009094; Buy Replacement CDL Mini-buses (3)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2013	0.042	0.878	1.675	859.230
New Bus Purchase**	=	2021	0.027	0.293	0.448	665.872

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.015	-0.585	-1.227	-193.358
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
90,000	1.15	103,500	302	343

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.015	1,000	343	1.0188	-0.005
Change in Summer NOx	-0.585	1,000	343	1.0188	-0.204
Change in Winter CO	-1.227	1,000	343	0.9812	-0.412
Change in Summer CO2	-193.358	1,000	343	1.0000	-66.267

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.005	302	-1.571
Summer NOx	-0.204	302	-61.636
Winter CO	-0.412	302	-124.561
Summer CO2	-66.267	302	-20012.553

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$375,000	12	1.571	\$19,889
Summer NOx	\$375,000	12	61.636	\$507
Winter CO	\$375,000	12	124.561	\$251
Summer CO2	\$375,000	12	20012.553	\$2

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2022** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0008835; Buy Replacement Cutaways (5)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2010	0.029	0.108	3.703	619.740
New Bus Purchase**	=	2022	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.026	-0.083	-3.111	-183.886
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
135,000	1.15	155,250	302	514

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.026	1,000	514	1.0188	-0.014
Change in Summer NOx	-0.083	1,000	514	1.0188	-0.043
Change in Winter CO	-3.111	1,000	514	0.9812	-1.569
Change in Summer CO2	-183.886	1,000	514	1.0000	-94.531

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.014	302	-4.086
Summer NOx	-0.043	302	-13.102
Winter CO	-1.569	302	-473.849
Summer CO2	-94.531	302	-28548.302

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$345,000	12	4.086	\$7,035
Summer NOx	\$345,000	12	13.102	\$2,194
Winter CO	\$345,000	12	473.849	\$61
Summer CO2	\$345,000	12	28548.302	\$1

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2022** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0008838; Buy Replacement Size C Low Floor Cutaways (3)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2014	0.008	0.058	2.014	501.185
New Bus Purchase**	=	2022	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.005	-0.033	-1.422	-65.331
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
108,000	1.15	124,200	250	497

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.005	1,000	497	1.0188	-0.003
Change in Summer NOx	-0.033	1,000	497	1.0188	-0.016
Change in Winter CO	-1.422	1,000	497	0.9812	-0.693
Change in Summer CO2	-65.331	1,000	497	1.0000	-32.456

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.003	250	-0.685
Summer NOx	-0.016	250	-4.123
Winter CO	-0.693	250	-173.260
Summer CO2	-32.456	250	-8114.110

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$340,000	12	0.685	\$41,350
Summer NOx	\$340,000	12	4.123	\$6,873
Winter CO	\$340,000	12	173.260	\$164
Summer CO2	\$340,000	12	8114.110	\$3

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2023** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0008839; Buy Replacement Cutaways (5)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2011	0.017	0.093	3.036	575.249
New Bus Purchase**	=	2023	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.014	-0.068	-2.443	-139.395
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
135,000	1.15	155,250	302	514

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.014	1,000	514	1.0188	-0.007
Change in Summer NOx	-0.068	1,000	514	1.0188	-0.035
Change in Winter CO	-2.443	1,000	514	0.9812	-1.233
Change in Summer CO2	-139.395	1,000	514	1.0000	-71.659

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.007	302	-2.192
Summer NOx	-0.035	302	-10.681
Winter CO	-1.233	302	-372.221
Summer CO2	-71.659	302	-21641.074

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$350,000	12	2.192	\$13,308
Summer NOx	\$350,000	12	10.681	\$2,731
Winter CO	\$350,000	12	372.221	\$78
Summer CO2	\$350,000	12	21641.074	\$1

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2024** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0008851; Buy Replacement Cutaways (5)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2011	0.017	0.093	3.036	575.249
New Bus Purchase**	=	2024	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.014	-0.068	-2.443	-139.395
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
135,000	1.15	155,250	302	514

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.014	1,000	514	1.0188	-0.007
Change in Summer NOx	-0.068	1,000	514	1.0188	-0.035
Change in Winter CO	-2.443	1,000	514	0.9812	-1.233
Change in Summer CO2	-139.395	1,000	514	1.0000	-71.659

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.007	302	-2.192
Summer NOx	-0.035	302	-10.681
Winter CO	-1.233	302	-372.221
Summer CO2	-71.659	302	-21641.074

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$355,000	12	2.192	\$13,498
Summer NOx	\$355,000	12	10.681	\$2,770
Winter CO	\$355,000	12	372.221	\$79
Summer CO2	\$355,000	12	21641.074	\$1

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: 2024 Bus Replacements

MPO: Montachusett

RTA: MART

RTD0008855; Buy Replacement 30' Bus (3)

Emission Rates in grams/mile at assumed operating speed bin of : 30 MPH

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2010	0.062	1.332	0.353	1,203.080
New Bus Purchase**	=	2024	0.048	0.764	0.275	1133.23

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.014	-0.568	-0.078	-69.850
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
120,000	1.15	138,000	302	457

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.014	1,000	457	1.0188	-0.006
Change in Summer NOx	-0.568	1,000	457	1.0188	-0.264
Change in Winter CO	-0.078	1,000	457	0.9812	-0.035
Change in Summer CO2	-69.850	1,000	457	1.0000	-31.918

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.006	302	-1.931
Summer NOx	-0.264	302	-79.832
Winter CO	-0.035	302	-10.616
Summer CO2	-31.918	302	-9639.300

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$1,350,000	12	1.931	\$58,251
Summer NOx	\$1,350,000	12	79.832	\$1,409
Winter CO	\$1,350,000	12	10.616	\$10,598
Summer CO2	\$1,350,000	12	9639.300	\$12

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2024** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0008856; Buy Replacement Size C Low Floor Cutaways (2)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2015	0.008	0.058	2.014	501.185
New Bus Purchase**	=	2024	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.005	-0.033	-1.422	-65.331
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
60,000	1.15	69,000	250	276

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.005	1,000	276	1.0188	-0.002
Change in Summer NOx	-0.033	1,000	276	1.0188	-0.009
Change in Winter CO	-1.422	1,000	276	0.9812	-0.385
Change in Summer CO2	-65.331	1,000	276	1.0000	-18.031

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.002	250	-0.381
Summer NOx	-0.009	250	-2.290
Winter CO	-0.385	250	-96.256
Summer CO2	-18.031	250	-4507.839

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$225,000	12	0.381	\$49,256
Summer NOx	\$225,000	12	2.290	\$8,187
Winter CO	\$225,000	12	96.256	\$195
Summer CO2	\$225,000	12	4507.839	\$4

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2025** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0009068; Buy Replacement Cutaways (5)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2013	0.017	0.093	3.036	575.249
New Bus Purchase**	=	2025	0.003	0.025	0.593	435.854

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.014	-0.068	-2.443	-139.395
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
135,000	1.15	155,250	302	514

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.014	1,000	514	1.0188	-0.007
Change in Summer NOx	-0.068	1,000	514	1.0188	-0.035
Change in Winter CO	-2.443	1,000	514	0.9812	-1.233
Change in Summer CO2	-139.395	1,000	514	1.0000	-71.659

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.007	302	-2.192
Summer NOx	-0.035	302	-10.681
Winter CO	-1.233	302	-372.221
Summer CO2	-71.659	302	-21641.074

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$360,000	12	2.192	\$13,688
Summer NOx	\$360,000	12	10.681	\$2,809
Winter CO	\$360,000	12	372.221	\$81
Summer CO2	\$360,000	12	21641.074	\$1

CMAQ Bus Replacement Air Quality Analysis Worksheet

FILL IN SHADED BOXES ONLY

TIP YEAR: **2025** Bus Replacements

MPO: **Montachusett**

RTA: **MART**

RTD0009094; Buy Replacement CDL Mini-buses (2)

Emission Rates in grams/mile at assumed operating speed bin of : **30 MPH**

Scenario Comparison		Model Year	Summer VOC (grams/mile)	Summer NOx (grams/mile)	Winter CO (grams/mile)	Summer CO2 (grams/mile)
Existing Model*	=	2015	0.037	0.855	1.249	733.688
New Bus Purchase**	=	2025	0.027	0.293	0.448	665.872

* Please contact OTP for assistance on Existing Model emission factors

** MOVES 2014a Commercial Emission Factors - Please Specify the Following:

AM or PM:	AM	Restricted or Unrestricted	Restricted
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Change (Buy-Base)	-0.010	-0.562	-0.801	-67.816
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Calculate fleet vehicle miles per day:

Revenue miles per year	X Deadhead factor	= fleet miles per year	/ operating days per year	= fleet miles per day
60,000	1.15	69,000	250	276

Calculate emissions change in kilograms per summer day

Change	rate change grams/mile	/ 1000 g/kg	X fleet miles per day	X seasonal adj factor	= change/day in kg
Change in Summer VOC	-0.010	1,000	276	1.0188	-0.003
Change in Summer NOx	-0.562	1,000	276	1.0188	-0.158
Change in Winter CO	-0.801	1,000	276	0.9812	-0.217
Change in Summer CO2	-67.816	1,000	276	1.0000	-18.717

Calculate emissions change in kilograms per year

Pollutant	= change/day in kg	X op.days per year	= change per year in kg
Summer VOC	-0.003	250	-0.700
Summer NOx	-0.158	250	-39.481
Winter CO	-0.217	250	-54.210
Summer CO2	-18.717	250	-4679.304

Calculate cost effectiveness (cost per kg of emissions reduced)

Pollutant	Total Project Cost	/ Project Life in years	/ reduction per year in kg	= annual cost per kg
Summer VOC	\$250,000	12	0.700	\$29,753
Summer NOx	\$250,000	12	39.481	\$528
Winter CO	\$250,000	12	54.210	\$384
Summer CO2	\$250,000	12	4679.304	\$4

CMAQ Air Quality Analysis Worksheet for Bicycle and Pedestrian Project

FILL IN SHADED BOXES ONLY

TIP YEAR: 2021

MPO: Montachusett

Municipality:

Fitchburg/Leominster

Project: FITCHBURG- LEOMINSTER- RAIL TRAIL CONSTRUCTION (TWIN CITIES RAIL TRAIL)

Step 1: Calculate Estimated Reduction in Vehicle Miles Traveled (VMT):

If VMT reduction per year is known then go to Step 2B, if not proceed with Step 1 :

Facility Length (L):	4.5	Miles		
Service Area Radius (R):	1.0	Miles	(Default = 1 Mile)	
Service Area of Community(ies) (SA): $L * 2R = SA$	9	Sq. Miles		
Total Land Area of Community(ies) (T):	56.7	Sq. Miles	Leominster	28.90
Service Area % of Community(ies) Land Area (LA): $SA / T = LA$	15.9%		Fitchburg	27.80
Total Population of Community(ies) (TP):	81,077	Persons	Leominster	40,759
Population Served by Facility (P): $LA * TP = P$	12,869	Persons	Fitchburg	40,318
Total Number of Households in Community(ies) (HH):	31,932	HH	Leominster	16,767
Number of Households Served by Facility (HS): $LA * HH = HS$	5,069	HH	Fitchburg	15,165
Total Number of Workers Residing in Community(ies) (W):	64,805	Persons	Leominster	32,610
Workers Per household (WPHH): $W / HH = WPHH$	2.03	Persons	Fitchburg	32,195
Workers in Service Area (WSA): $HS * WPHH = WSA$	10,287	Persons		
Population Density of the Service area (PD): $P / SA = PD$	1,430	Persons Per Sq. Mile		

If the bicycle and pedestrian commuter mode share is known, enter the percentage at the right.

(BMS) 4.3%

If not, use US Census - American Community Survey data to determine the mode share and enter the percentage.

<http://www.census.gov/programs-surveys/acs/guidance/estimates.html>

Leominster 2.84%

Bike and Ped. Work Utilitarian Trips (BWT): $WSA * BMS = BWT$

443 One-Way Trips

Fitchburg

5.78%

Bike and Ped. Non-Work Utilitarian Trips (BNWT): $BWT * 1.7 = BNWT$

754 One-Way Trips

(Latest planning assumptions estimate non-work utilitarian trips to be 1.7 times the work utilitarian.)

Step 2: Calculate the VMT Reduction Per Day:

$((2 * BWT) + (2 * BNWT)) * (0.5 * L) = VMTR$

5386.7 VMTR Per Day

VMTR * Operating Days Per Year

$5,386.7 * 200 =$

1,077,337 VMTR Per Year

If the Vehicle Miles Traveled Reduction is known enter in the box to the right.

VMTR Per Year

Note: A manual entry of the VMTR will override the calculated cell.

Step 3: MOVES 2014a Emission Factors for Unrestricted PM:

Note: Use 35 MPH as a default if average speed is not known.

Speed Used:

35 MPH

Eastern or Western

Eastern

2016 Passenger Summer VOC Factor grams/mile	2016 Passenger Summer NOx Factor grams/mile	2016 Passenger Summer CO Factor grams/mile	2016 Passenger Summer CO2 Factor grams/mile
0.047	0.163	2.460	378.555

Step 4: Calculate emissions reductions in kilograms per year (Seasonally Adjusted):

Summer VOC	Summer NOx	Summer CO	Summer CO2
51.4	178.4	2,700.2	407,831.4

Step 5: Calculate cost effectiveness (first year cost per kg of emissions reduced)

Emission	Project Cost	Emission Reduction in kg per year	First year cost per kilogram
Summer VOC	\$18,030,889	51.4 =	\$351,019
Summer NOx	\$18,030,889	178.4 =	\$101,094
Summer CO	\$18,030,889	2,700.2 =	\$6,678
Summer CO2	\$18,030,889	407,831.4 =	\$44

CMAQ Air Quality Analysis Worksheet for Bicycle and Pedestrian Project

FILL IN SHADED BOXES ONLY

TIP YEAR: 2023-2025

MPO: Montachusett

Municipality:

Leominster

Project: LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022

Step 1: Calculate Estimated Reduction in Vehicle Miles Traveled (VMT):

If VMT reduction per year is known then go to Step 2B, if not proceed with Step 1 :

Facility Length (L):	2.6	Miles	
Service Area Radius (R):	1.0	Miles	(Default = 1 Mile)
Service Area of Community(ies) (SA): $L * 2R = SA$	5.2	Sq. Miles	
Total Land Area of Community(ies) (T):	28.82	Sq. Miles	
Service Area % of Community(ies) Land Area (LA): $SA / T = LA$	18.0%		
Total Population of Community(ies) (TP):	41,832	Persons	
Population Served by Facility (P): $LA * TP = P$	7,548	Persons	
Total Number of Households in Community(ies) (HH):	16,767	HH	
Number of Households Served by Facility (HS): $LA * HH = HS$	3,025	HH	
Total Number of Workers Residing in Community(ies) (W):	17,514	Persons	
Workers Per household (WPHH): $W / HH = WPHH$	1.04	Persons	
Workers in Service Area (WSA): $HS * WPHH = WSA$	3,160	Persons	
Population Density of the Service area (PD): $P / SA = PD$	1,451	Persons Per Sq. Mile	

If the bicycle and pedestrian commuter mode share is known, enter the percentage at the right.

(BMS) 2.5%

If not, use US Census - American Community Survey data to determine the mode share and enter the percentage.

<http://www.census.gov/programs-surveys/acs/guidance/estimates.html>

Bike and Ped. Work Utilitarian Trips (BWT): $WSA * BMS = BWT$ 79 One-Way Trips

Bike and Ped. Non-Work Utilitarian Trips (BNWT): $BWT * 1.7 = BNWT$ 134 One-Way Trips

(Latest planning assumptions estimate non-work utilitarian trips to be 1.7 times the work utilitarian.)

Step 2: Calculate the VMT Reduction Per Day:

$((2 * BWT) + (2 * BNWT)) * (0.5 * L) = VMTR$ 554.6 VMTR Per Day

VMTR * Operating Days Per Year $554.6 * 200 =$ 110,918 VMTR Per Year

If the Vehicle Miles Traveled Reduction is known enter in the box to the right. VMTR Per Year

Note: A manual entry of the VMTR will override the calculated cell.

Step 3: MOVES 2014a Emission Factors for Unrestricted PM:

Note: Use 35 MPH as a default if average speed is not known.

Speed Used: 35 MPH Eastern or Western Eastern

2016 Passenger Summer VOC Factor, grams/mile	2016 Passenger Summer NOx Factor grams/mile	2016 Passenger Summer CO Factor grams/mile	2016 Passenger Summer CO2 Factor grams/mile
0.047	0.163	2.460	378.555

Step 4: Calculate emissions reductions in kilograms per year (Seasonally Adjusted):

Summer VOC	Summer NOx	Summer CO	Summer CO2
5.3	18.4	278.0	41,988.6

Step 5: Calculate cost effectiveness (first year cost per kg of emissions reduced)

Emission	Project Cost	Emission Reduction in kg per year	First year cost per kilogram
Summer VOC		5.3 =	\$0
Summer NOx		18.4 =	\$0
Summer CO		278.0 =	\$0
Summer CO2		41,988.6 =	\$0

CMAQ Air Quality Analysis Worksheet for Traffic Flow and Intersection Improvements

FILL IN SHADED BOXES ONLY

IP YEAR: 2020

MPO: Montachusett

Municipality: Lancaster

Project: 608779 - Intersection Improvements on Rt 117/Rt 70 at Lunenburg Rd (Intersection #1)

Step 1: Calculate Existing AM Peak Hour Total Intersection Delay in Seconds:

Street Name	Dir	Left-Turns (Vol / PHF X delay =) per veh	Total move. delay	Thru (Vol / PHF X delay =) per veh	Total move. delay	Right-Turns (Vol / PHF X delay =) per veh	Total move. delay	Total approach delay
	NB	0.95 =	0 +	0.95 =	0 +	0.95 =	0 =	0
Lunenburg	SB	256 0.95 670.0 =	180,547 +	0.95 =	0 +	30 0.95 11.5 =	363 =	180,911
Main St.	EB	0.95 =	0 +	939 0.95 9.0 =	8,896 +	0.95 =	0 =	8,896
Main St.	WB	0.95 =	0 +	590 0.95 0.0 =	0 +	0.95 =	0 =	0
Total Intersection Delay/Seconds = 189,806								

Step 2: Calculate Existing PM Peak Hour Total Intersection Delay in Seconds:

Street Name	Dir	Left-Turns (Vol / PHF X delay =) per veh	Total move. delay	Thru (Vol / PHF X delay =) per veh	Total move. delay	Right-Turns (Vol / PHF X delay =) per veh	Total move. delay	Total approach delay
	NB	0.95 =	0 +	0.95 =	0 +	0.95 =	0 =	0
Lunenburg	SB	232 0.95 964.6 =	235,565 +	0.95 =	0 +	64 0.95 21.9 =	1,475 =	237,041
Main St.	EB	0.95 =	0 +	481 0.95 12.2 =	6,177 +	0.95 =	0 =	6,177
Main St.	WB	0.95 =	0 +	1,265 0.95 0.0 =	0 +	0.95 =	0 =	0
Total Intersection Delay/Seconds = 243,218								

Step 3: The spreadsheet automatically chooses the peak hour with the longer total intersection delay for the next step in the analysis.

Peak Hour (AM/PM):

PM

Total Intersection Delay:

243,218

Step 4: Calculate the existing PM Peak Hour Total Intersection Delay with Improvements:

Street Name	Dir	Left-Turns (Vol / PHF X delay =) per veh	Total move. delay	Thru (Vol / PHF X delay =) per veh	Total move. delay	Right-Turns (Vol / PHF X delay =) per veh	Total move. delay	Total approach delay
	NB	0.95 =	0 +	0.95 =	0 +	0.95 =	0 =	0
Lunenburg	SB	232 0.95 46.5 =	11,356 +	0.95 =	0 +	64 0.95 29.1 =	1,960 =	13,316
Main St.	EB	45 0.95 15.1 =	715 +	436 0.95 5.3 =	2,432 +	0.95 =	0 =	3,148
Main St.	WB	0.95 =	0 +	819 0.95 21.7 =	18,708 +	446 0.95 11.1 =	5,211 =	23,919
Total Intersection Delay/Seconds = 40,383								

Step 5: Calculate vehicle delay in hours per day:

	Existing peak hour intersection delay	Peak hour intersection delay w/ improvements	Delay in seconds	X	Hours per day	/	Seconds per hour	=	Delay in hours / day
			243,218	X	10	/	3600	=	675.6
			40,383	X	10	/	3600	=	112.2

Step 6: MOBILE 6 emission factors for arterial idling speed:

	2020	2020	2020	AM or PM
	Summer VOC Factor	Summer NOx Factor	Winter CO Factor	Summer CO2 Factor
	grams/hour	grams/hour	grams/hour	grams/hour
	0.249	0.629	3.570	3565.610

Step 7: Calculate net emissions change in kilograms per day:

	Delay in Hours per Day	Summer VOC Emissions kilograms/day	Summer NOx Emissions kilograms/day	Winter CO Emissions kilograms/day	Summer CO2 Emissi kilograms/day
Existing Conditions	675.6	0.168	0.425	2.412	2,408.945
With Improvements	112.2	0.028	0.071	0.400	399.970
Net Change		-0.140	-0.354	-2.011	-2,008.975

Step 8: Calculate net emissions change in kilograms per year (seasonally adjusted)

	Net change per day (kg) X	Avg. weekdays per year	Seasonal adj. X	Adj. net change in kg per year
Summer VOC Emissions	-0.140 X	250	X 1.0188 =	-35.733
Summer NOx Emissions	-0.354 X	250	X 1.0188 =	-90.265
Winter CO Emissions	-2.011 X	250	X 0.9812 =	-493.408
Summer CO2 Emissions	##### X	250	X 1.0000 =	-502,243.797

Calculate cost effectiveness (first year cost per kg of emissions reduced)

Emission	Project Cost	Adj. net change in kg per year	First year cost per kilogram
Summer	\$2,500,590	-35.733 =	\$69,980
Summer	\$2,500,590	-90.265 =	\$27,703
Winter CO	\$2,500,590	-493.408 =	\$5,068
Summer	\$2,500,590	-502,243.797 =	\$5

CMAQ Air Quality Analysis Worksheet for Traffic Flow and Intersection Improvements

FILL IN SHADED BOXES ONLY

TIP YEAR: 2020

MPO: Montachusett

Municipality: Lancaster

Project: 608779 - Intersection Improvements on Rt 117/Rt 70 at Lunenburg Rd (Intersection #2)

Step 1: Calculate Existing AM Peak Hour Total Intersection Delay in Seconds:

Street Name	Dir	Left-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	+ (Vol / PHF)	Thru X delay per veh	=	Total move. delay	+ (Vol / PHF)	Right-Turns PHF	X delay per veh	=	Total move. delay	=	Total approach delay
Main St (Rt 70)	NB	136	0.95		89.2	=	12,770	+	0.95				=	0	=	12,770
	SB		0.95			=	0	+	0.95				=	0	=	0
Main St (Rt 117)	EB		0.95			=	0	+	1,155	0.95		0.0	=	0	=	0
7 Bridge Rd	WB		0.95			=	0	+	474	0.95		9.4	=	4,690	+	4,690
Total Intersection Delay/Seconds =																17,460

Step 2: Calculate Existing PM Peak Hour Total Intersection Delay in Seconds:

Street Name	Dir	Left-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	+ (Vol / PHF)	Thru X delay per veh	=	Total move. delay	+ (Vol / PHF)	Right-Turns PHF	X delay per veh	=	Total move. delay	=	Total approach delay
Main St (Rt 70)	NB	188	0.95		329.4	=	65,187	+	0.95				=	0	=	65,187
	SB		0.95			=	0	+	0.95				=	0	=	0
Main St (Rt 117)	EB		0.95			=	0	+	666	0.95		0.0	=	0	=	0
7 Bridge Rd	WB		0.95			=	0	+	1,095	0.95		8.8	=	10,143	+	10,143
Total Intersection Delay/Seconds =																75,330

Step 3: The spreadsheet automatically chooses the peak hour with the longer total intersection delay for the next step in the analysis.

Peak Hour (AM/PM): PM

Total Intersection Delay: 75,330

Step 4: Calculate the existing PM Peak Hour Total Intersection Delay with Improvements:

Street Name	Dir	Left-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	+ (Vol / PHF)	Thru X delay per veh	=	Total move. delay	+ (Vol / PHF)	Right-Turns PHF	X delay per veh	=	Total move. delay	=	Total approach delay
Main St (Rt 70)	NB	188	0.95		54.0	=	10,686	+	0.95				=	0	=	10,686
	SB		0.95			=	0	+	0.95				=	0	=	0
Main St (Rt 117)	EB		0.95			=	0	+	410	0.95		4.1	=	1,769	+	2,767
7 Bridge Rd	WB	7	0.95		5.5	=	41	+	1,088	0.95		21.1	=	24,165	+	24,206
Total Intersection Delay/Seconds =																37,658

Step 5: Calculate vehicle delay in hours per day:

	(Delay in seconds X Hours per day)	/	Seconds per hour	=	Delay in hours / day
Existing peak hour intersection delay	(75,330 X 10)	/	3600	=	209.2
Peak hour intersection delay w/ improvements	(37,658 X 10)	/	3600	=	104.6

Step 6: MOBILE 6 emission factors for arterial idling speed:

	2020	2020	2020	AM or PM	PM
Summer VOC Factor	grams/hour	grams/hour	grams/hour	grams/hour	grams/hour
	0.249	0.629	3.570	3565.610	

Step 7: Calculate net emissions change in kilograms per day:

	Delay in Hours per Day	Summer VOC Emissions kilograms/day	Summer NOx Emissions kilograms/day	Winter CO Emissions kilograms/day	Summer CO2 Emissi kilograms/day
Existing Conditions	209.2	0.052	0.132	0.747	746.101
With Improvements	104.6	0.026	0.066	0.373	372.987
Net Change		-0.026	-0.066	-0.374	-373.114

Step 8: Calculate net emissions change in kilograms per year (seasonally adjusted)

	Net change per day (kg) X	Avg. weekdays per year	Seasonal adj. X	factor	=	Adj. net change in kg per year
Summer VOC Emissions	-0.026 X	250	X	1.0188	=	-6.636
Summer NOx Emissions	-0.066 X	250	X	1.0188	=	-16.764
Winter CO Emissions	-0.374 X	250	X	0.9812	=	-91.638
Summer CO2 Emissions	-373.114 X	250	X	1.0000	=	-93,278.495

Calculate cost effectiveness (first year cost per kg of emissions reduced)

Emission	Project Cost	/	Adj. net change in kg per year	=	First year cost per kilogram
Summer VOC	\$2,500,590	/	-6.636	=	\$376,796
Summer NOx	\$2,500,590	/	-16.764	=	\$149,161
Winter CO	\$2,500,590	/	-91.638	=	\$27,288
Summer CO2	\$2,500,590	/	-93,278.495	=	\$27

CMAQ Air Quality Analysis Worksheet for Traffic Flow and Intersection Improvements

FILL IN SHADED BOXES ONLY

TIP YEAR: 2020

MPO: Montachusett

Municipality:

Lancaster

Project: 608779 - Intersection Improvements on Rt 117/Rt 70 at Lunenburg Rd (Totals)

Step 1: Calculate Existing AM Peak Hour Total Intersection Delay in Seconds:

Street Name	Dir	Left-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	+	Thru (Vol / PHF)	X delay per veh	=	Total move. delay	+	Right-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	=	Total approach delay
	NB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	SB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	EB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	WB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
Total Intersection Delay/Seconds =																	0

Step 2: Calculate Existing PM Peak Hour Total Intersection Delay in Seconds:

Street Name	Dir	Left-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	+	Thru (Vol / PHF)	X delay per veh	=	Total move. delay	+	Right-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	=	Total approach delay
	NB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	SB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	EB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	WB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
Total Intersection Delay/Seconds =																	0

Step 3: The spreadsheet automatically chooses the peak hour with the longer total intersection delay for the next step in the analysis.

Peak Hour (AM/PM): PM

Total Intersection Delay: 0

Step 4: Calculate the existing PM Peak Hour Total Intersection Delay with Improvements:

Street Name	Dir	Left-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	+	Thru (Vol / PHF)	X delay per veh	=	Total move. delay	+	Right-Turns (Vol / PHF)	X delay per veh	=	Total move. delay	=	Total approach delay
	NB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	SB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	EB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
	WB		0.95	=	0	+		0.95	=	0	+		0.95	=	0	=	0
Total Intersection Delay/Seconds =																	0

Step 5: Calculate vehicle delay in hours per day:

Existing peak hour intersection delay	(	Delay in seconds	X	Hours per day	)	/	Seconds per hour	=	Delay in hours / day
	(	0	X	10	)	/	3600	=	0.0
Peak hour intersection delay w/ improvements	(	0	X	10	)	/	3600	=	0.0

Step 6: MOBILE 6 emission factors for idling speed:

2020	2020	2020	AM or PM
Summer VOC Factor grams/hour	Summer NOx Factor grams/hour	Winter CO Factor grams/hour	Summer CO2 Factor grams/hour
0.249	0.629	3.570	AM

Step 7: Calculate net emissions change in kilograms per day:

	Delay in Hours per Day	Summer VOC Emissions kilograms/day	Summer NOx Emissions kilograms/day	Winter CO Emissions kilograms/day	Summer CO2 Emissions kilograms/day
Existing Conditions	0.0	0.000	0.000	0.000	0.000
With Improvements	0.0	0.000	0.000	0.000	0.000
Net Change		0.000	0.000	0.000	0.000

Step 8: Calculate net emissions change in kilograms per year (seasonally adjusted)

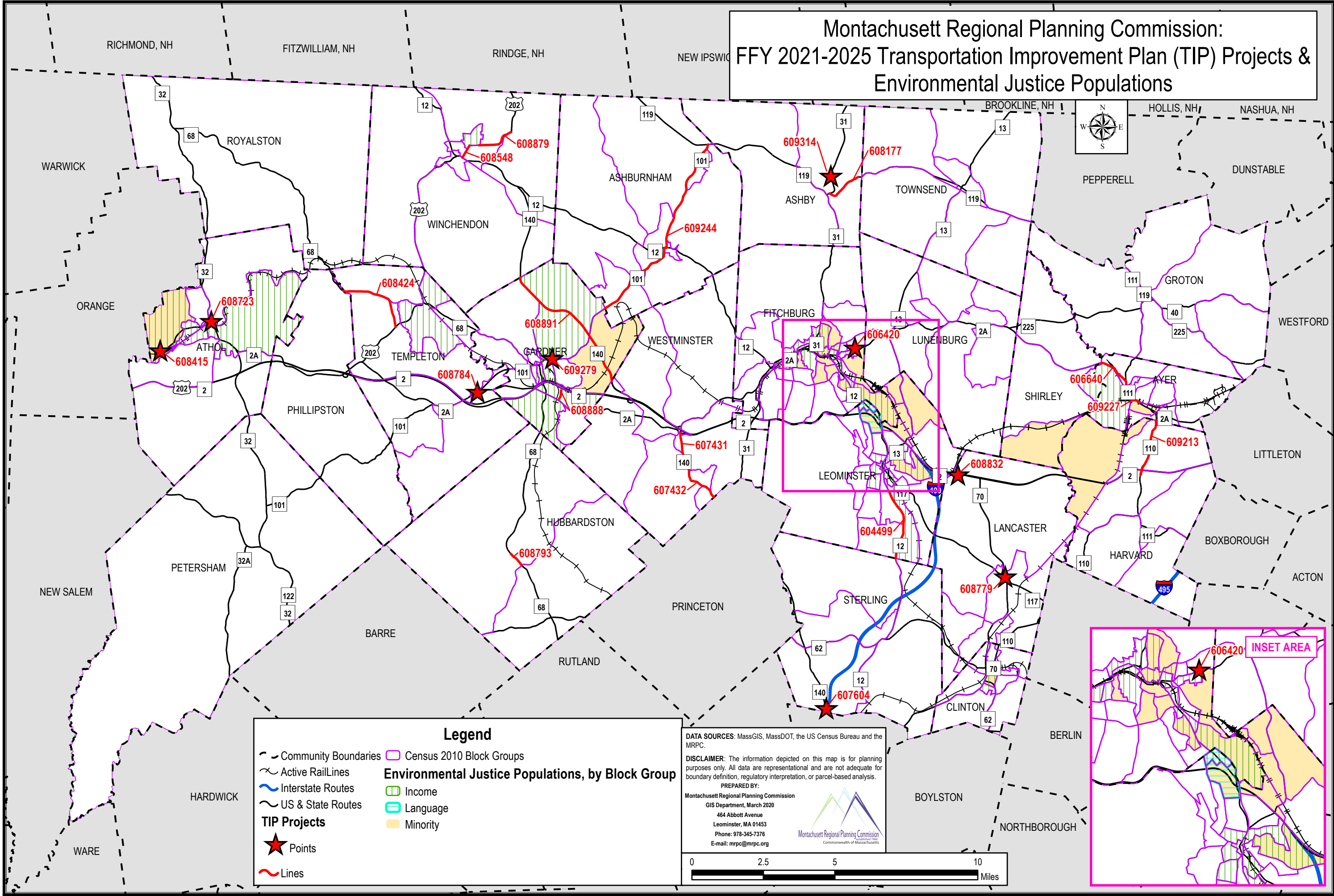
	Net change per day (kg) X	Avg. weekdays per year	Seasonal adj. X	Adj. net change in kg per year
Summer VOC Emissions	0.000 X	250	X 1.0188 =	-42.369
Summer NOx Emissions	0.000 X	250	X 1.0188 =	-107.030
Winter CO Emissions	0.000 X	250	X 0.9812 =	-585.046
Summer CO2 Emissions	0.000 X	250	X 1.0000 =	-595,522.000

Calculate cost effectiveness (first year cost per kg of emissions reduced)

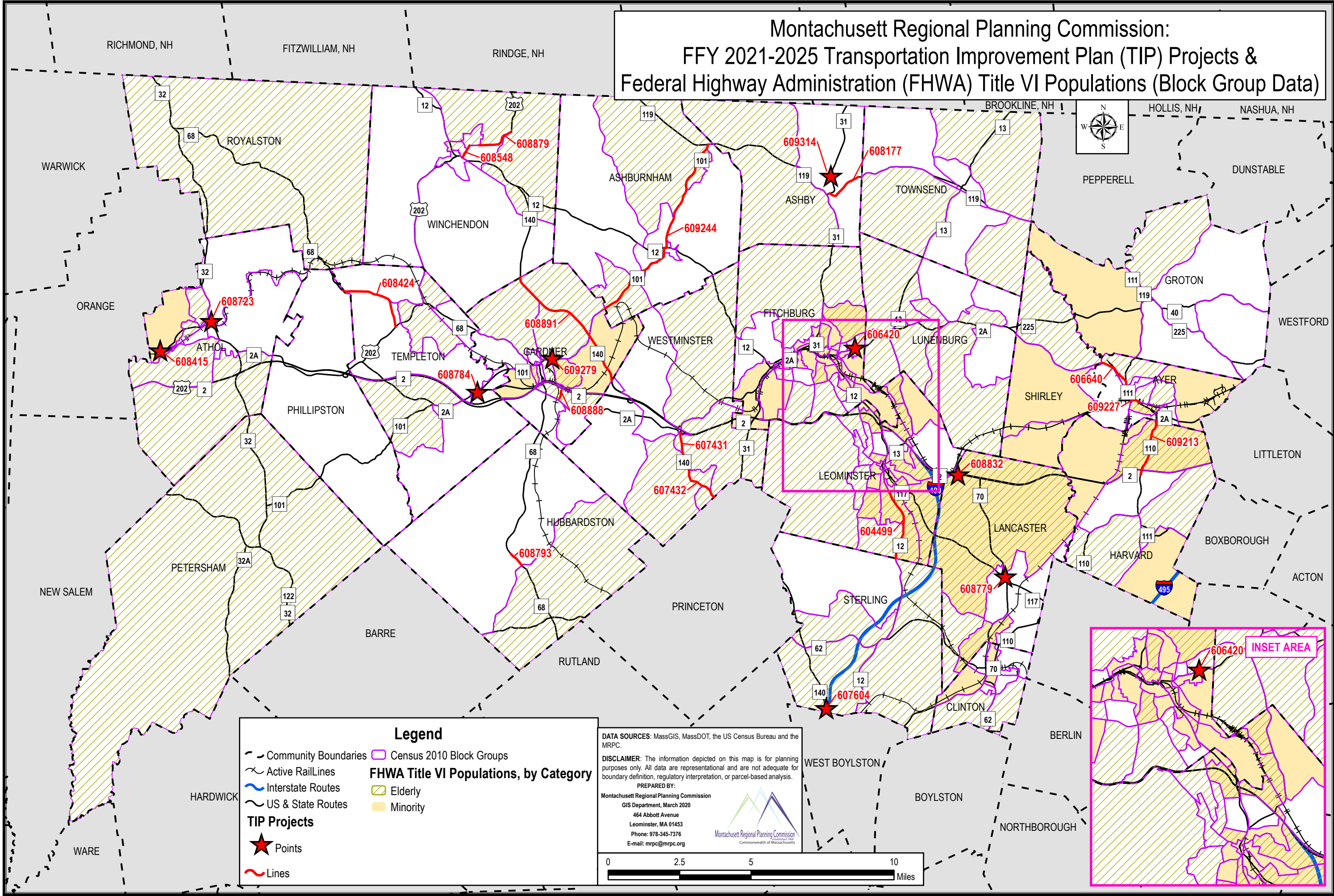
Emission	Project Cost	Adj. net change in kg per year	First year cost per kilogram
Summer VOC	\$2,500,590	-42.369 =	\$59,019
Summer NOx	\$2,500,590	-107.030 =	\$23,363
Winter CO	\$2,500,590	-585.046 =	\$4,274
Summer CO2	\$2,500,590	-595,522.000 =	\$4

APPENDIX D – EQUITY DISTRIBUTION ANALYSIS OF TIP PROJECTS MAPS

Montachusett Regional Planning Commission: FFY 2021-2025 Transportation Improvement Plan (TIP) Projects & Environmental Justice Populations



Montachusett Regional Planning Commission:
FFY 2021-2025 Transportation Improvement Plan (TIP) Projects &
Federal Highway Administration (FHWA) Title VI Populations (Block Group Data)



Legend

Community Boundaries	Census 2010 Block Groups
Active Rail Lines	
Interstate Routes	
US & State Routes	
TIP Projects	
Points	
Lines	

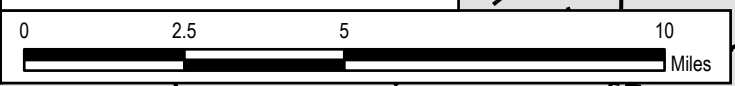

FHWA Title VI Populations, by Category

Elderly	
Minority	

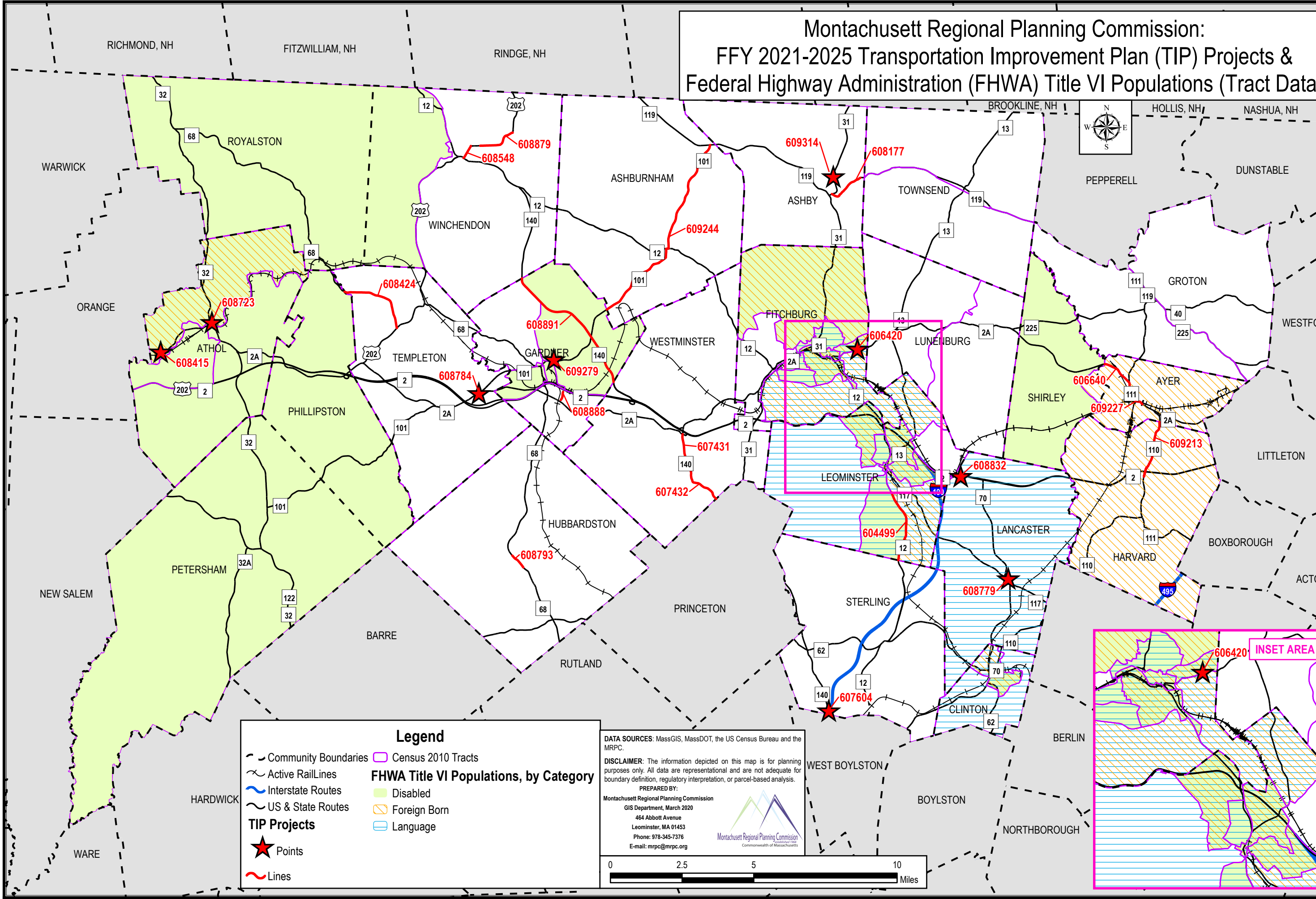
DATA SOURCES: MassGIS, MassDOT, the US Census Bureau and the MRPC.

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.

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GIS Department, March 2020
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E-mail: mrpc@mrpc.org



Montachusett Regional Planning Commission:
FFY 2021-2025 Transportation Improvement Plan (TIP) Projects &
Federal Highway Administration (FHWA) Title VI Populations (Tract Data)



Community Boundaries

Active RailLines

Interstate Routes

US & State Routes

TIP Projects

Points

Lines

Census 2010 Tracts

FHWA Title VI Populations, by Category

Disabled

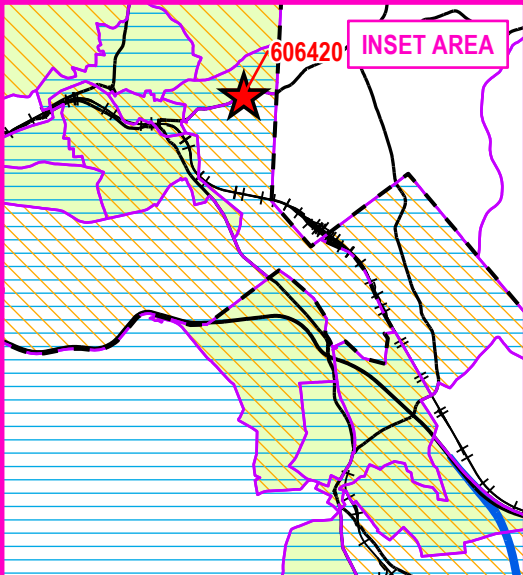
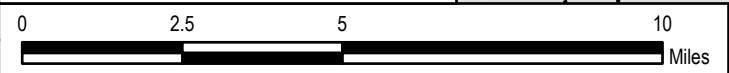
Foreign Born

Language

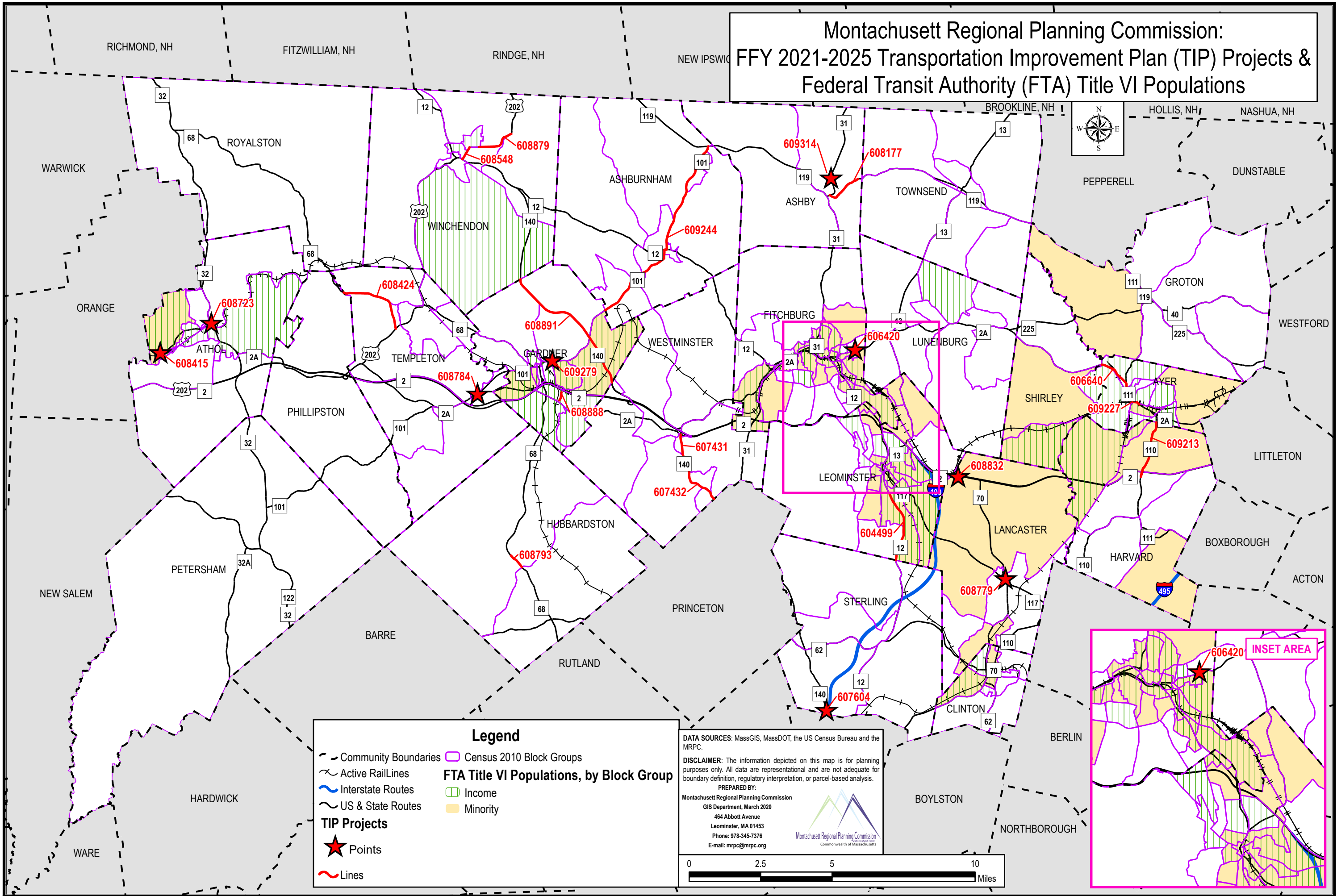
DATA SOURCES: MassGIS, MassDOT, the US Census Bureau and the MRPC.

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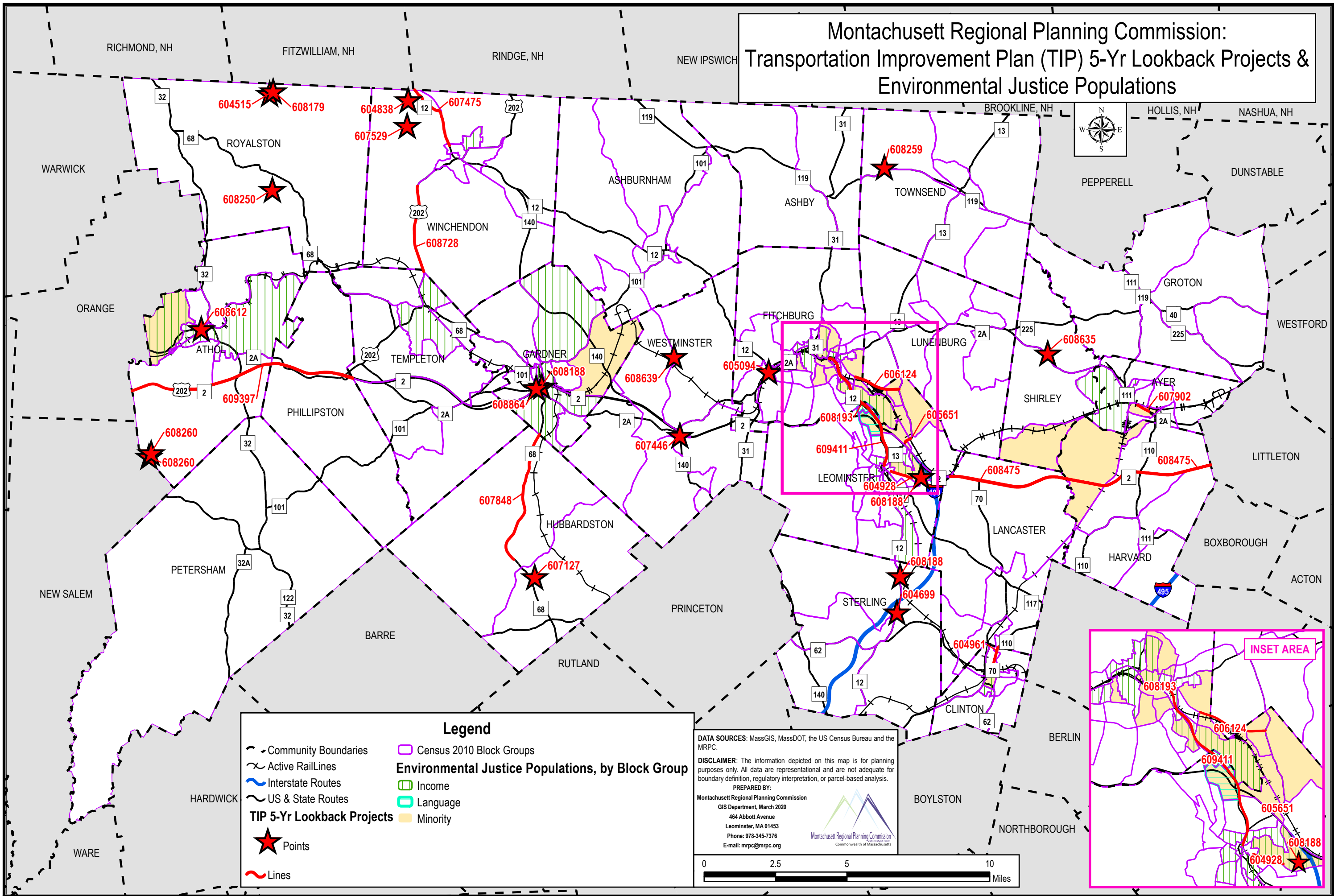
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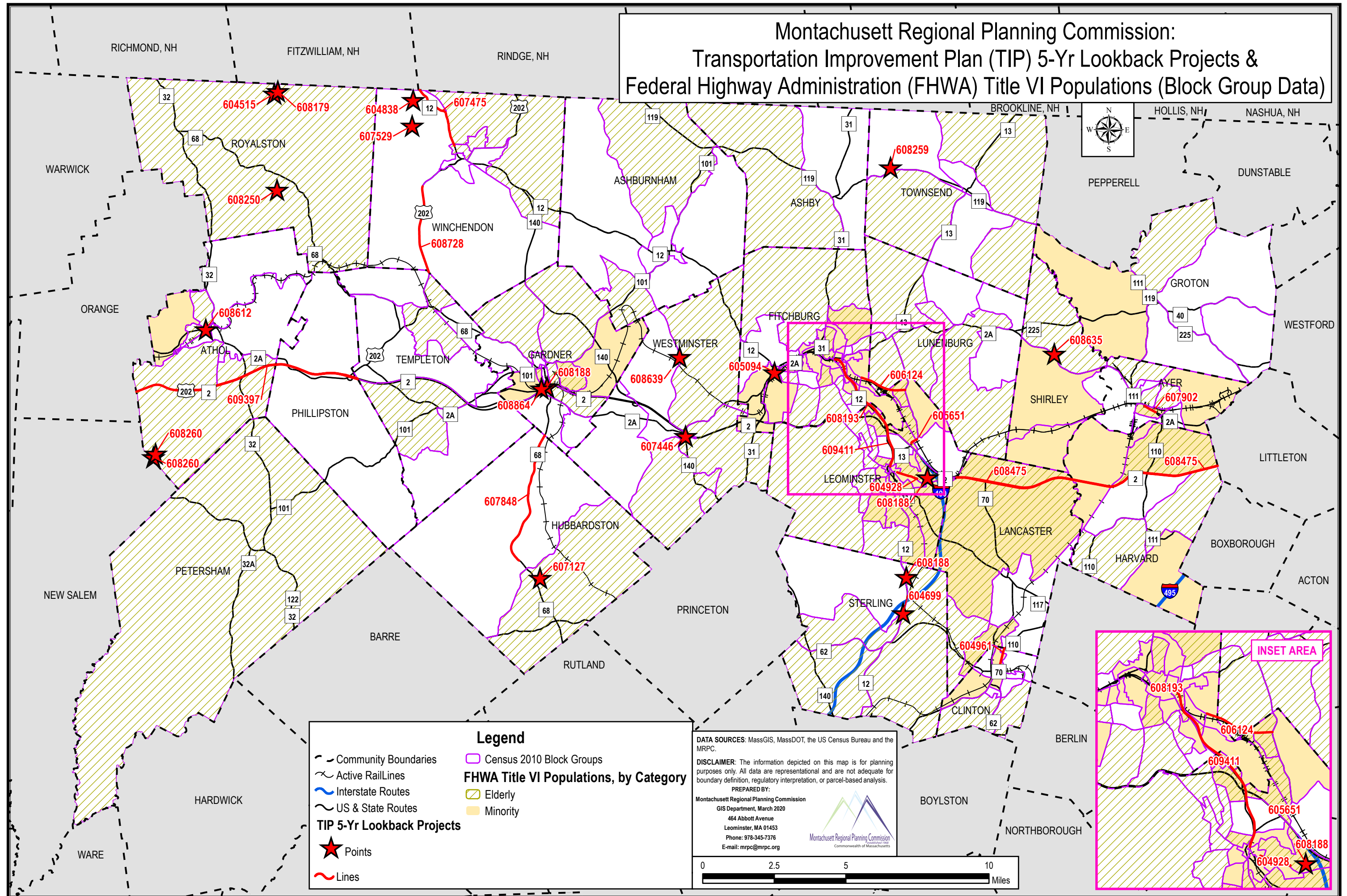
Montachusett Regional Planning Commission:
FFY 2021-2025 Transportation Improvement Plan (TIP) Projects &
Federal Transit Authority (FTA) Title VI Populations



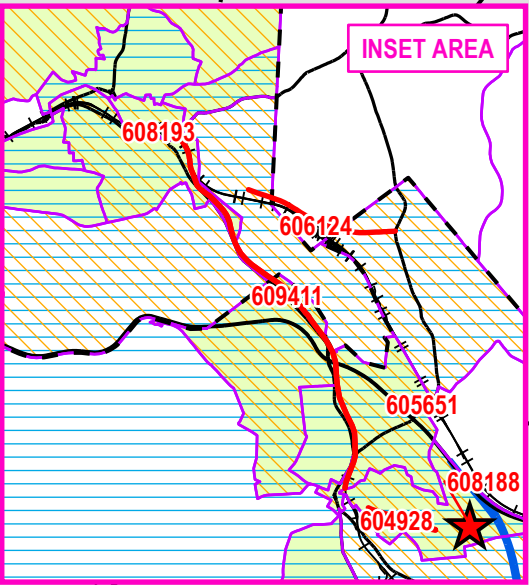
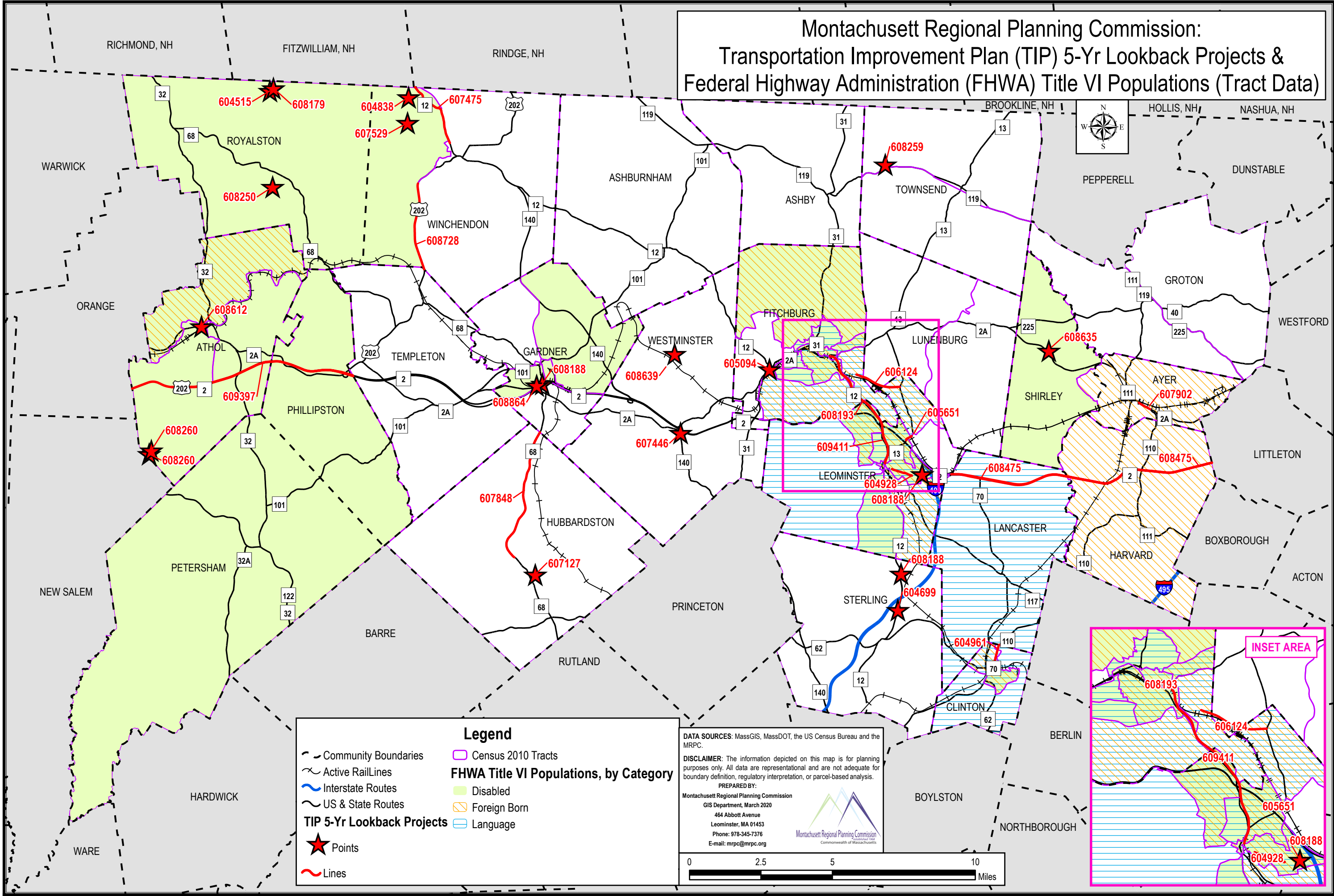
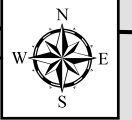
Montachusett Regional Planning Commission:
Transportation Improvement Plan (TIP) 5-Yr Lookback Projects &
Environmental Justice Populations



<p>Montachusett Regional Planning Commission: Transportation Improvement Plan (TIP) 5-Yr Lookback Projects & Federal Highway Administration (FHWA) Title VI Populations (Block Group Data)</p>
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Montachusett Regional Planning Commission:
Transportation Improvement Plan (TIP) 5-Yr Lookback Projects &
Federal Highway Administration (FHWA) Title VI Populations (Tract Data)



Legend

Community Boundaries	Census 2010 Tracts
Active RailLines	FHWA Title VI Populations, by Category
Interstate Routes	Disabled
US & State Routes	Foreign Born
TIP 5-Yr Lookback Projects	Language
Points	
Lines	

DATA SOURCES: MassGIS, MassDOT, the US Census Bureau and the MRPC.

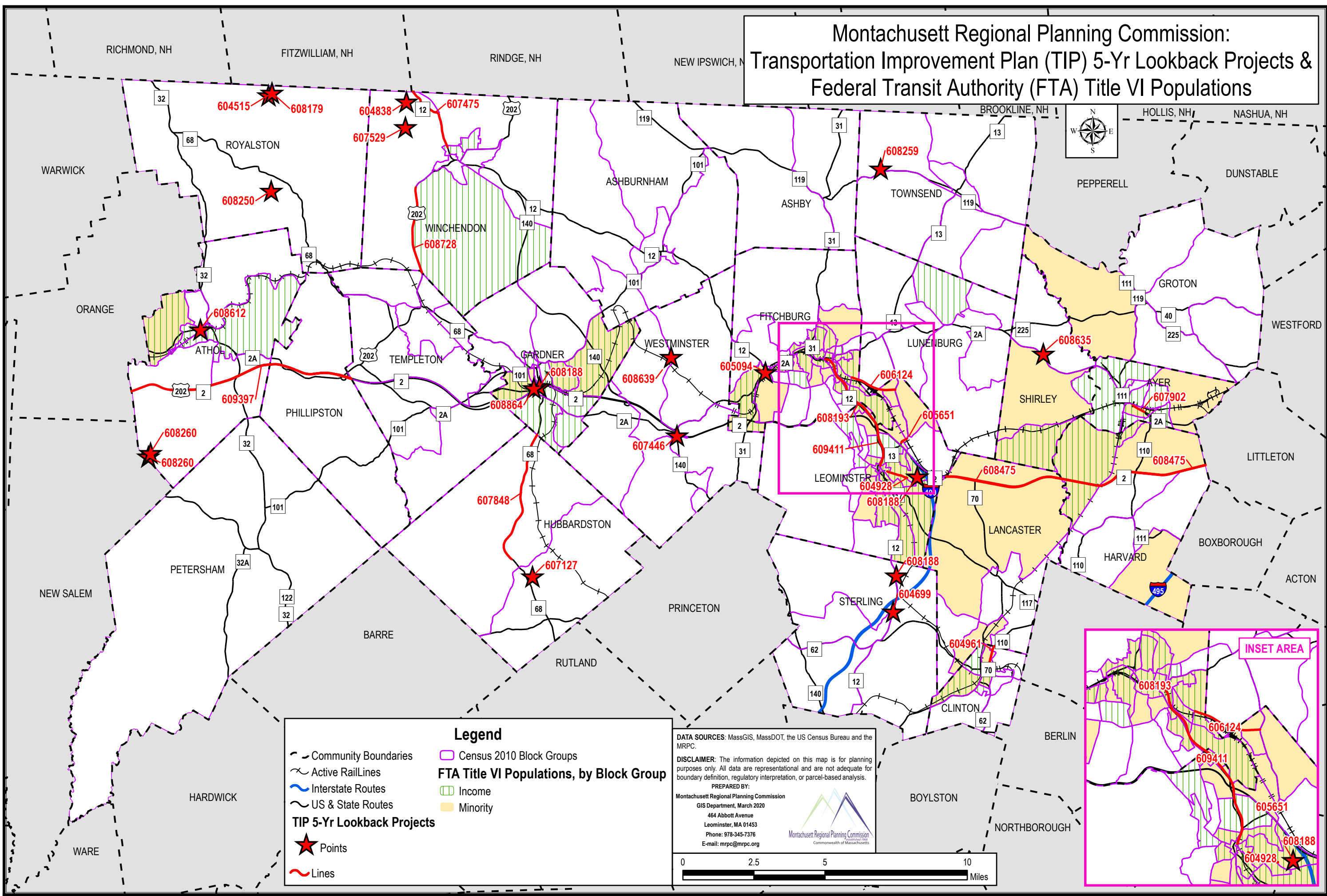
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Montachusett Regional Planning Commission
Commonwealth of Massachusetts

0 2.5 5 10 Miles

Montachusett Regional Planning Commission: Transportation Improvement Plan (TIP) 5-Yr Lookback Projects & Federal Transit Authority (FTA) Title VI Populations



ATTACHMENT 1 - COMMENTS RECEIVED ON DRAFT TIP

Comment 1	<p>MassDOT OTP - Completeness</p> <p>Please ensure final version includes all maps and comments received within the appendix.</p> <p>Please clarify the role of Mayor Dean Mazzarella on page vi. Additionally, on page vii, please confirm with District 2 that Jeffrey Hoynoski is still the JTC representative</p> <p>On page i, please ensure the City of Leominster is listed as a signatory or provide an asterisk or footnote clarifying Mayor Dean Mazzarella's role on the MPO.</p> <p>The table on page 45 (reliability, modernization, and expansion) should include 2021 - 2025 figures (currently says 2020 - 2024). Additionally, please update the dates on pages 49-51 within the air quality conformity determination.</p>
Response 1	Noted, changes and updates have been made throughout
Comment 2	<p>MassDOT OTP - Narrative</p> <p>References to UPWP could be strengthened, perhaps through describing how UPWP studies translate to TIP projects</p> <p>As it pertains to procedures for adjustments and amendments, please ensure the types of actions listed are more comprehensive through referencing MassDOT's STIP procedures distributed as part of the annual MARPA guidance (e.g. change in project description, change in additional information, etc.)</p>
Response 2	Additions and updates have been made to the narrative
Comment 3	<p>MassDOT OTP - Performance Measurement</p> <p>The Montachusett Regional Transit Authority's (MART) Transit Asset Management (TAM) Plan is referenced, but the targets are not included. Please ensure the final version explicitly includes TAM targets</p> <p>Only highway targets are included. Please also include transit targets.</p> <p>The discussion on the relationship between performance targets and project selection could be strengthened through referencing transportation evaluation criteria (TEC) scoring and its connection with the regional performance measures in the performance management section.</p> <p>Please include regional data for PM1, as well as for PM2 and PM3 to the extent feasible.</p> <p>On pages 18 - 21, please correct table formatting issues.</p>
Response 3	Additional information and references are included
Comment 4	<p>MassDOT OTP - Project Listing</p> <p>Please ensure the municipality name is listed correctly for project 604499 (Leominster Route 12). This may involve manually updating the downloadable template from eSTIP.</p> <p>Please ensure the project, "Buy Replacement 30ft Bus (3)" (RTD0008855) is listed correctly and is in line with what is included in Grants Plus.</p> <p>Please include the "STIP Investment Reports," downloadable from the eSTIP application, within an appendix to show additional information for each programmed project.</p>
Response 4	All changes/ additions added

Comment 5	<p>MassDOT OTP - Impact Analysis</p> <p>Please include the sum of all decreases in emissions across TIP years at the end of the GHG emissions analysis for both highway and transit projects. In doing so, be sure to only count the total reductions from project 604499 (Leominster Route 12) once, within the last AC year. Also, within the transit GHG analysis on page 85, please revise the table title for 2021 (currently says 2025).</p> <p>A map provided shows the geographic distribution of TIP projects, but there is no table.</p> <p>The social equity analysis should only include programmed projects, not all projects included within the appendix. Please break out programmed target projects within the analysis.</p>
Response 5	Changes/ additions made
Comment 6	<p>Town of Ashburnham</p> <p>Letter received in support of project #60924- ASHBURNAM - Resurfacing an relate work from Corey Hill/Williams Road the Gardner City Line. Indicates the town's commitment to the project and the allocation of additional resources to patch the road. The town is working toward being at 100% design in FFY 2022 or 2023.</p>
Response 6	Noted, this project's status will be monitored and considered in future TIPs
Comment 7	<p>FHWA - Minor Edits</p> <p>Page 3 - Update reference to LEP Access Plan adoption date from September 2013 to November 2019</p> <p>Page 4 - Unclear what this means: "any project listed in Year 1 of the endorsed TIP will be considered to have the concurrence of the MPO without further action required." If a TIP is endorsed, doesn't that mean all projects in Years 1-5 have concurrence of the MPO? Please clarify</p> <p>Page 33 - TIGER is no longer an active program. Please change to BUILD: https://www.transportation.gov/BUILDgrants</p> <p>Page 35 - In the narrative introducing the table, it states that "all figures presented represent the total project costs, i.e. federal/state/local amounts combined, for that particular funding category." Subtotal indicates "FHWA", but this states total project costs using fed/state/local shares. Not accurate. Same for transit table.</p>
Response 7	All minor edits made
Comment 8	<p>FHWA - Performance Measures</p> <p>Page 4 - Performance measures/targets are not part of project prioritization discussion. If TPM is part of TEC scoring, this should be explicitly stated.</p> <p>Page 12 - For "FFY 2021-2025 Target Eligible Projects" table, it would be nice to see an additional column that connects the TIP project to the performance measure/goal area.</p> <p>Page 18 - For Regional Transportation Plan – Performance Measures discussion, FHWA concurs with MassDOT that this should be strengthened through TEC reference. It would be nice to see how PBPP connects to project selection and how projects support the measures/targets. We saw this missing from the project prioritization discussion above.</p>
Response 8	TEC scoring as related to project selection and RTP Performance Measures is now referenced in the Performance Management section.

Comment 9	FHWA - RTP Priorities Page 35 - It is difficult to determine if the projects identified in the TIP are consistent with the RTP. We recommend better aligning the TIP with the RTP in this regard. The RTP organizes the financial plan by funding program area/strategy vs. individual project for the life of the plan, including the first five years (which should translate to the TIP) (e.g., see Table 10-15 in RTP). The program area/strategy is not transferred to the TIP (which organizes by Federal funding category vs. RTP strategy). With that, it is challenging to ensure project selection is following the plan. Adding some connection here to the RTP strategy would be an enhancement. Same with transit table.
Response 9	Additional table is provided in the document providing analysis. Staff will work to assign current and future TIP projects an RTP strategy category to help ensure RTP strategies are being followed. Furthermore, TEC scoring helps ensure proper weight is given to project which reflect RTP strategies, goals and overall benefit to the transportation network.