



2024

RTP



Regional
Transportation
Plan



**2024 Update
to the
Regional Transportation Plan**

Final Report

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Prepared by the
Pioneer Valley Planning Commission

For the Pioneer Valley
Metropolitan Planning Organization

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CHAPTER 1



1. INTRODUCTION

The Pioneer Valley Regional Transportation Plan (RTP) outlines the direction of transportation planning and improvements for the Pioneer Valley through the year 2050. It provides the basis for state and federally funded transportation improvement projects and planning studies. Last published in 2019, the RTP is updated at least every 4 years and is endorsed by the Pioneer Valley Metropolitan Planning Organization (MPO).

As the Pioneer Valley's blueprint for maintaining a safe and efficient transportation system for all modes of travel, this long-range plan identifies the region's goals, strategies, and projects to both enhance and maintain our transportation system. The RTP is developed in concert with the federal Infrastructure Investment and Jobs Act (IIJA) legislation also referred to as the Bipartisan Infrastructure Law (BIL). Massachusetts Department of Transportation (MassDOT) priorities and initiatives also assist in RTP development.

All projects included as part of the regional Transportation Improvement Program (TIP) must come from a conforming RTP. This is extremely important as most major transportation improvement projects rely on federal transportation funds for construction. The following projects are just a few examples of recent transportation improvements in the Pioneer Valley region that advanced through a conforming RTP.

- Restoration of Springfield's Union Station.
- Repairs to the Interstate I-91 Viaduct in Springfield.
- Expansion of regional passenger rail service.
- Westfield's Columbia River Greenway Trail.
- State of the art electric buses at the Pioneer Valley Transit Authority.

Although the RTP focuses on transportation, it is a comprehensive planning document that has been developed and coordinated with other planning efforts in the region. The plan recognizes that while we do not know the future, change is inevitable and must happen in a manner that is beneficial to our residents, workers, economy, and landscape. Changes in land use and development patterns transform the traditional visual character and function of the region and transportation plays a significant role in influencing how the region will grow and change.

Strategic planning is a continuing process that produces planning documents and agendas which decision-makers can use to prioritize local needs. A truly effective planning process relies upon the input of the locally elected officials, municipal staff, and the public. In addition, the strategic planning process is based on a realistic assessment of external forces - political, social, economic, and technological - that can affect our region. All recommendations generated through the strategic planning process must have a real potential for implementation. By developing the RTP for the Pioneer Valley in such a manner, the region will be able to implement necessary transportation improvements that are beneficial for all.

A. VISION, GOALS, AND EMPHASIS AREAS

The Pioneer Valley Metropolitan Planning Organization developed a vision to provide a framework for the development of the RTP.

RTP Vision

The Pioneer Valley region strives to develop and maintain a safe, dependable, resilient, environmentally sound, and equitable transportation system for all using performance-based strategies that promote sustainability, health and economic vitality.

1. Regional Goals

To support the realization of the Vision of the plan for the Pioneer Valley MPO, a series of thirteen transportation goals were developed that are consistent with the BIL. Cooperation between federal, state, regional, and local decision makers will be necessary in order to achieve these goals. Through cooperative planning efforts the region can maintain a dependable transportation system and develop strategies to maximize the efficiency of transportation funding for the region.

Goals

1. Safety
 2. Operations and Maintenance
 3. Environment
 4. Coordination
 5. Energy Efficiency
 6. Cost Effectiveness
 7. Intermodal/Multimodal
 8. Economic Productivity
 9. Quality of Life
 10. Environmental Justice
 11. Land Use
 12. Climate Change
1. **Safety** - To provide and maintain a transportation system that is safe for users of all travel modes and eliminates fatalities and serious injuries.
 2. **Operations and Maintenance** - To provide a transportation system that is dependable, resilient, and accessible for all users. To give priority to adaptable repair of existing infrastructure.
 3. **Environmental** - To minimize the transportation related adverse impacts to air, land, wildlife and water quality and strive to improve environmental conditions, reduce noise and incorporate green infrastructure.
 4. **Coordination** - To facilitate collaborative efforts between the general public and local, state and federal planning and project implementation activities. To coordinate planning activities and projects with neighboring states and regions.

5. **Energy Efficiency** - To reduce car dependency and promote the reduction of energy consumption through demand management techniques and increasing the use of energy efficient travel modes.
6. **Cost Effective** - To provide an affordable transportation system for all users that is cost effective to maintain, improve and operate.
7. **Intermodal/Multimodal** - To provide access to and between all travel modes for people and goods while maintaining quality and affordable service.
8. **Economically Productive** - To maintain a transportation system that promotes and supports economic stability and expansion.
9. **Quality of Life** - To provide and maintain a transportation system that enhances quality of life and improves the social and economic climate of the region.
10. **Environmental Justice** - To provide an equitable distribution of transportation benefits and burdens for all people as defined in the region's [Title VI Notice of Nondiscrimination](#).
11. **Land Use** - To incorporate the concepts of Sustainable Development in the regional transportation planning process and integrate the recommendations of the current Regional Land Use Plan into transportation improvements.
12. **Climate Change** -To promote and advance transportation projects that reduce vulnerability to the effects of climate change, decrease the production of greenhouse gasses, such as CO₂, and advance new energy technologies consistent with the Pioneer Valley Climate Action & Clean Energy Plan.

2. Emphasis Areas

A total of five emphasis areas were identified to assist in the achievement of the regional goals. The transportation emphasis areas consist of broad topics related to transportation planning that are related to the regional goals. These emphasis areas are not intended to be a replacement for the regional transportation goals; instead, they were established with the recognition that many of the transportation improvement strategies included as part of the RTP can meet multiple goals. The emphasis areas connect regional transportation needs, strategies, and projects and will be covered in greater detail in Chapter 14.

Emphasis Areas

1. Safety and Security
2. Movement of People
3. Movement of Goods
4. Movement of Information
5. Sustainability

CHAPTER 2



2. TRANSPORTATION PLANNING PROCESS

The Pioneer Valley MPO is required by federal law to conduct the metropolitan transportation planning process for the region based on the requirements of the Infrastructure Investment and Jobs Act (IIJA) also commonly referred to as the Bipartisan Infrastructure Law (BIL). The BIL continues the Metropolitan Planning Program, which establishes a cooperative, continuous, and comprehensive (3C) framework for transportation planning in metropolitan areas. As the lead planning agency for the Pioneer Valley Metropolitan Planning Organization (MPO), the Pioneer Valley Planning Commission (PVPC) is responsible for the day to day management of this process.

A. REQUIREMENTS

1. Infrastructure Investment and Jobs Act (IIJA)

The Infrastructure Investment and Jobs Act, also referred to as the Bipartisan Infrastructure Law (BIL), was signed into law by President Biden on November 15, 2021. This transportation bill is the largest long-term investment in our nation's infrastructure and economy. It provides \$550 billion over the life of the Bill in new Federal investment in infrastructure, including roads, bridges, transit, water infrastructure, resiliency, and broadband internet access.

a) Planning Factors

All metropolitan planning organizations are required to incorporate ten factors into their planning process. The Ten Planning Factors are:

- Support the economic vitality of the metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase the accessibility and mobility of people and for 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.
- Enhancing travel and tourism.

b) Federal Planning Emphasis Areas

FHWA and FTA have established Federal Planning Emphasis Areas to assist in the implementation of the BIL and guide regional transportation planning efforts. The Federal Planning Emphasis Areas are:

- **Tackling the Climate Crisis** – Transition to a Clean Energy, Resilient Future. The RTP should advance strategies that help achieve the national greenhouse gas reduction goals of 50-52 percent below 2005 levels by 2030, and net-zero emissions by 2050, and increase resilience to extreme weather events and other disasters resulting from the increasing effects of climate change.
- **Equity and Justice⁴⁰ in Transportation Planning** - The Pioneer Valley RTP will advance racial equity and support for underserved and disadvantaged communities, comply with Executive Orders 13985 and 14008 and support State and MPO goals for economic opportunity in disadvantaged communities that have been historically marginalized and overburdened by pollution and underinvestment in housing, transportation, water and wastewater infrastructure, recreation, and health care.
- **Complete Streets** - A complete street is safe, and feels safe, for all users and travel modes. The RTP should prioritize safety, comfort, and access to destinations for people who use the street network,

including pedestrians, bicyclists, transit riders, micro-mobility users, freight delivery services, and motorists. Complete travel networks that prioritize safety improvements and speed management should be emphasized to provide an equitable and safe transportation network for travelers of all ages and abilities.

- **Public Involvement** - Early, effective, and continuous public involvement brings diverse viewpoints into the transportation planning process. The use of virtual public involvement tools (VPI) is encouraged to increase opportunities for meaningful public participation in transportation planning activities included in the RTP.
- **Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination** - The MPO should coordinate transportation planning and project programming tasks with the DOD for the purpose of addressing the needs of the federal-aid highway system in meeting national and civil defense. This includes the entire Dwight D. Eisenhower National System of Interstate and Defense Highways and other non-Interstate public highways on the National Highway System.
- **Federal Land Management Agency (FLMA) Coordination** - The Pioneer Valley MPO must coordinate with FLMAs on transportation planning and project programming activities to ensure access routes and transportation services that connect to Federal lands are properly maintained. All FLMAs must be included in the development of the Regional Transportation Plan and Transportation Improvement Program.
- **Planning and Environment Linkages (PEL)** - PEL is a collaborative and integrated approach to transportation decision making that considers environmental, community, and economic goals early in the transportation planning process. The RTP should advance transportation programs and projects that serve the community's transportation needs more effectively while avoiding and minimizing the impacts on human and natural resources.
- **Data in Transportation Planning** - The RTP should incorporate and advance data sharing principles to efficiently use resources and share all transportation data to improve policy and decision making at all levels.

2. Clean Air Act Amendments of 1990

The Regional Transportation Plan must demonstrate compliance with federal Clean Air legislation – the Clean Air Act Amendments of 1990. Specifically, the RTP must demonstrate of how this plan will work to achieve National Ambient Air Quality standards. This compliance is addressed as part of Chapter 16 of the RTP.

3. Title VI/ Environmental Justice /Justice 40

Title VI states that "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Title VI bars intentional discrimination as well as disparate impact discrimination (i.e., a neutral policy or practice that has a disparate impact on protected groups).

The Environmental Justice (EJ) Orders further amplify Title VI by providing that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

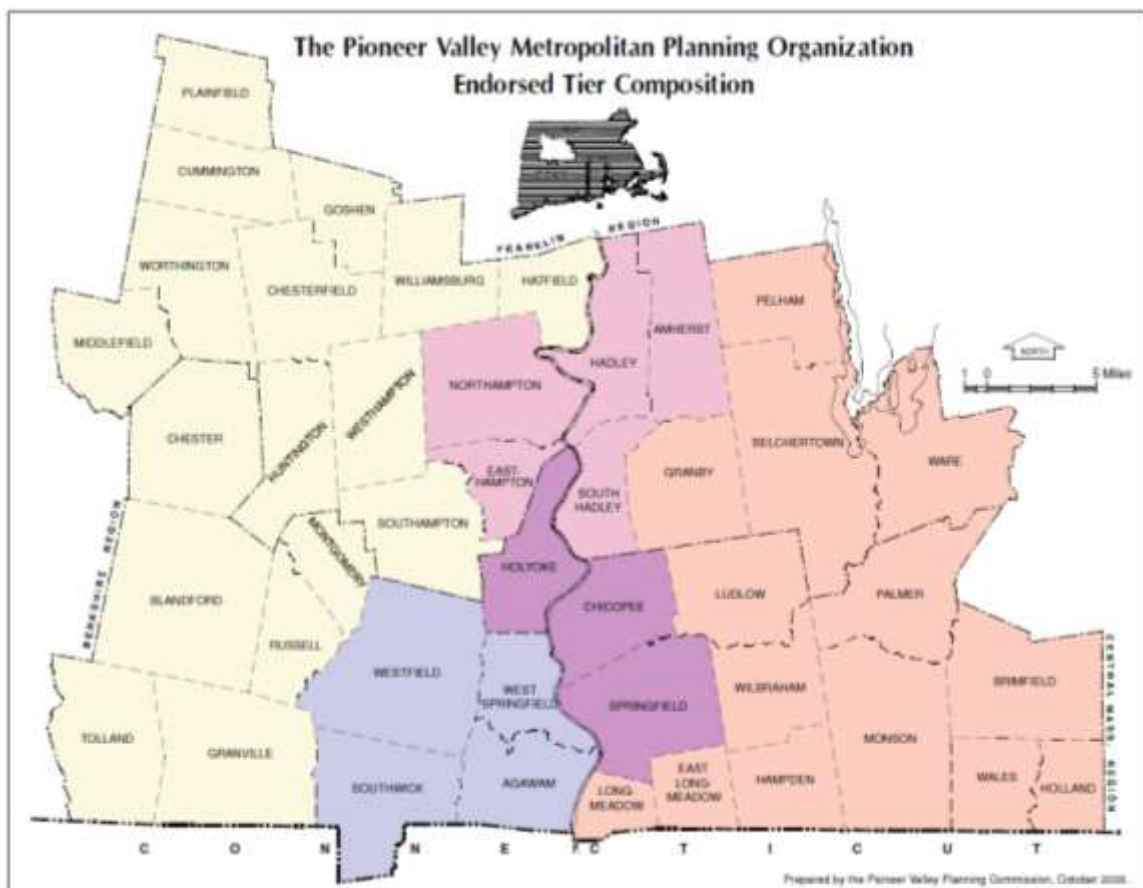
Both Title VI and Environmental Justice are covered in greater detail as part of Chapter 4 of the RTP. This also included a self-certification of the MPO's compliance with Title VI and Environmental Justice planning requirements.

The Justice 40 Initiative was enacted under an Executive Order by President Biden. Justice 40 has the goal that 40 percent of the overall benefits of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. The US Department of Transportation (USDOT) has released information on a number of programs covered under Justice 40. For more information, please visit: <https://www.transportation.gov/priorities/equity/justice40/covered-programs>.

B. THE PIONEER VALLEY METROPOLITAN PLANNING ORGANIZATION (MPO)

The Pioneer Valley Metropolitan Planning Organization (MPO) implements and oversees the 3C transportation planning process to provide an open comprehensive, cooperative, and continuing transportation planning and programming process in conformance with federal and state requirements. The Pioneer Valley MPO was restructured in August of 2006 to enhance the role of the local communities in the transportation planning process and allow local MPO members to represent sub-regional districts respective to community size and geographic location. A more recent update in 2017 recognized the Western Massachusetts Economic Development Council as a voting member.

Figure 2-1 - Pioneer Valley MPO



The Pioneer Valley MPO consists of the following officials, their designee (as allowed under the current Memorandum of Understanding), or alternate.

- The Secretary and CEO of the Massachusetts Department of Transportation
- The Administrator of the Massachusetts Department of Transportation Highway Division
- The Chair of the Pioneer Valley Planning Commission
- The Chair of the Pioneer Valley Transit Authority
- The President and CEO of the Western Massachusetts Economic Development Council (EDC)
- The Mayors of two of the following three (3) urban core cities:

Chicopee	Holyoke	Springfield
----------	---------	-------------
- The Mayor or a Selectboard Member of one of the following four (4) cities and towns:

Agawam	Southwick	Westfield
West Springfield		
- The Mayor, Counselor, or a Selectboard Member of one of the following five (5) cities and towns:

Amherst	Easthampton	Hadley
Northampton	South Hadley	
- A Counselor or Selectboard Member of one of the following fourteen (14) suburban and rural towns:

Belchertown	Brimfield	East Longmeadow
Granby	Hampden	Holland
Longmeadow	Ludlow	Monson
Palmer	Pelham	Wales
Ware	Wilbraham	
- A Selectboard Member of one of the following seventeen (17) suburban and rural towns:

Blandford	Chester	Chesterfield
Cummington	Goshen	Granville
Hatfield	Huntington	Middlefield
Montgomery	Plainfield	Russell
Southampton	Tolland	Westhampton
Williamsburg	Worthington	

In addition, the Administrator of the Pioneer Valley Transit Authority, the Administrator of the Franklin Regional Transit Authority, the Joint Transportation Committee (JTC) Chair, and one representative each from the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the five (5) alternate community MPO representatives, and one

representative each from both the Massachusetts Department of Transportation Highway Division District One and District Two Offices shall be considered ex-officio, non-voting members of the Pioneer Valley MPO. Alternate members shall be additional chief elected officials from each of the above-cited categories of communities and he/she shall be eligible to attend, participate and vote at MPO meetings in the event that the primary member cannot attend.

The MPO jointly develops, reviews, and endorses core planning documents such as the Regional Transportation Plan, Unified Planning Work Program and Transportation Improvement Program. The MPO also oversees all amendments to these core plans and other programs that are required by federal and state laws and regulations.

a) Joint Transportation Committee (JTC)

The Pioneer Valley Joint Transportation Committee (JTC) is the region's transportation advisory group for the Pioneer Valley Metropolitan Planning Organization (MPO). The committee is designed to assist the MPO in incorporating citizen participation in transportation decisions which provides a mechanism for federal, state, and local input into the regional transportation planning process. Each community is asked to appoint two representatives (a member and an alternate) to the committee. The Pioneer Valley MPO also appoints other transportation organizations in the region to serve on the JTC.

The JTC convenes monthly meetings open to the public. The planning program and the various functional elements of the planning process are developed cooperatively with the JTC with the purpose of establishing a recommendation for action by MPO. The JTC is responsible for coordination of all regional transportation related plans and programs in cooperation with PVPC staff and Pioneer Valley MPO.

i) **Bicycle, Pedestrian and Complete Streets Subcommittee**

The Pioneer Valley Joint Transportation's Bicycle, Pedestrian and Complete Streets Subcommittee was established by the JTC in 2000. The subcommittee is responsible for the oversight and coordination of planning activities related to non-motorized modes of transportation.

ii) **TIP Subcommittee**

The Pioneer Valley Transportation Improvement Program (TIP) Subcommittee was established by the JTC in 2003. The goal of the subcommittee is to develop recommendations for the entire JTC on candidate projects to be included as part of the current TIP. Factors such as the project's score from the Pioneer Valley Transportation Evaluation

Criteria (TEC), current design status, environmental permitting status, and status of any needed right of way acquisition are all used to develop the listing of projects recommended for inclusion in the TIP.

C. KEY PRODUCTS

1. Transportation Improvement Program

The Pioneer Valley TIP is a four-year schedule of priority highway, bridge, transit, and multimodal projects identified by year and location complete with funding source and cost. The TIP is developed annually and is available for amendment and adjustment at any time. Each program year of the TIP coincides with the Federal Fiscal Year calendar, October 1 through September 30. All TIPs and amendments are consistent with the goals and objectives of the Regional Transportation Plan for the Pioneer Valley region and are financially constrained. More information on the TIP can be found [here](#).

2. Unified Planning Work Program

The Unified Planning Work Program (UPWP) is a narrative description of the annual technical work program for the region. The UPWP provides an indication of regional long and short-range transportation planning objectives, the manner in which these objectives will be achieved, the budget necessary to sustain the overall planning effort, and the sources of funding for each specific program element. Work tasks included as part of the UPWP are reflective of issues and concerns originating from transportation agencies at the federal, state, and local levels. More information on the UPWP can be found [here](#).

3. Public Participation Process

The MPO has a proactive public involvement process that provides complete information, timely public notice, and full public access to MPO activities at all key stages in the decision making process. The MPO involves the public early in the planning process, and actively seeks out the involvement of communities most affected by particular plans or projects. The Region's transportation plans and programs are developed in a manner that assures that the public, and affected communities in particular, are consulted and afforded ample opportunity to participate in the development of such plans. The most recent version of the Public Participation plan for the MPO can be found [here](#).

4. RTP Amendment Process

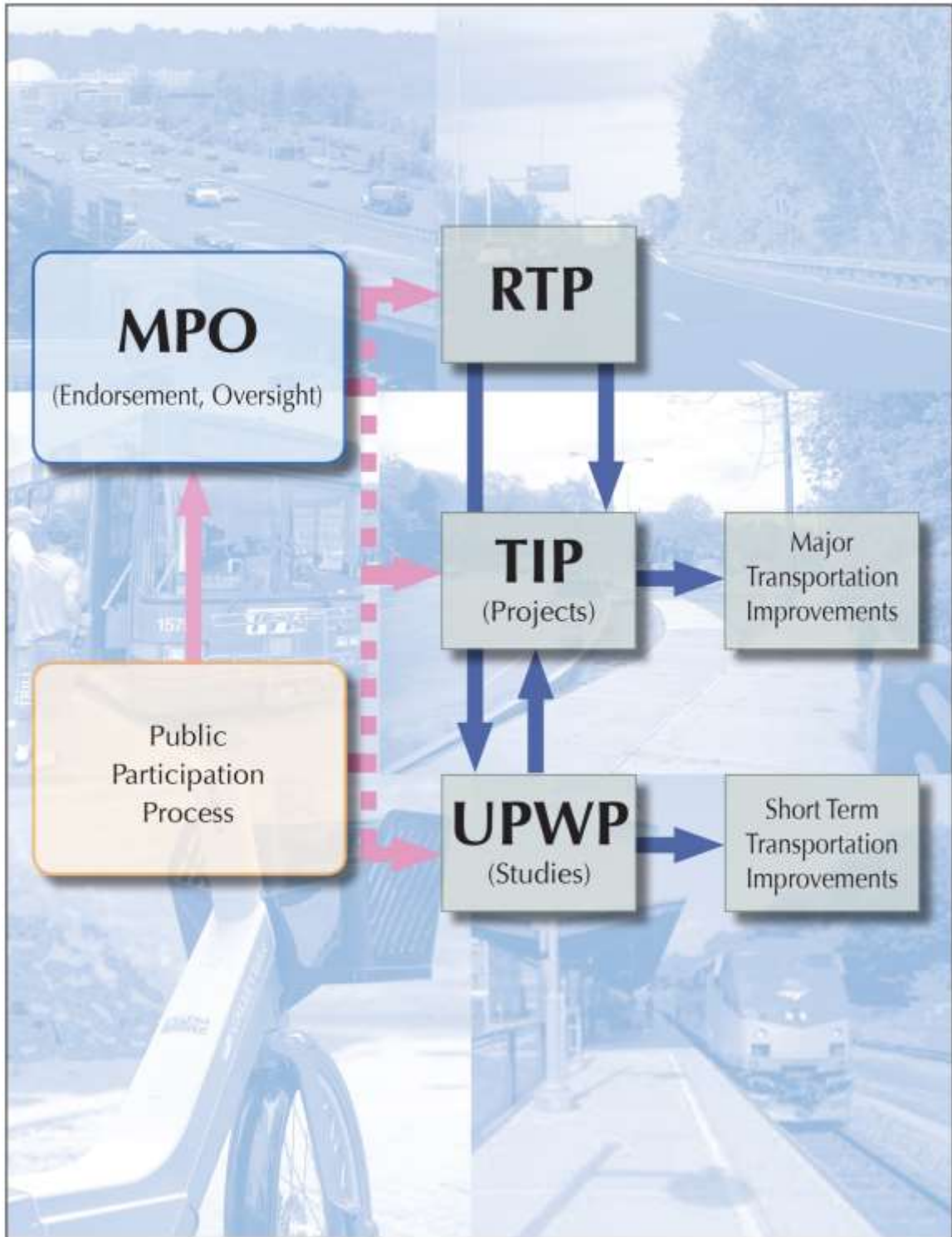
If, during the four year cycle of the adopted long range transportation plan (RTP), it becomes apparent that changes are necessary, the RTP will be

amended by redefining the appropriate chapter or section as necessary. All changes will be developed in cooperation with MassDOT, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Pioneer Valley Transit Authority (PVTA), and other concerned agencies as appropriate. Typical changes include, but are not limited to:

- Modification of the Financial Constraint Chapter to reflect changes in projected transportation funding as presented in the endorsed RTP.
- Changes required by FHWA or FTA to demonstrate conformity.
- The addition or removal of a regionally significant project that impacts the current Transportation Improvement Program.
- Other actions as defined or requested by the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), or the Pioneer Valley MPO.

Proposed amendments to the RTP will be presented to the Pioneer Valley MPO for release for a minimum 21 day public comment period and require MPO endorsement at the end of the agreed comment period.

Figure 2-2 - Regional Transportation Planning Process Flowchart



CHAPTER 3



3. PUBLIC PARTICIPATION

The Draft Regional Transportation Plan for the Pioneer Valley (RTP) underwent a public review and comment period consistent with the Pioneer Valley Region Public Participation Process. Early in the development of the RTP a series of focus groups were convened to assist in the development of the draft document. Focus groups consisted of a core group of representatives that were invited to participate in a discussion on the development of the vision statement, goals, needs and problem statements included in the RTP. There were a total of five focus groups on the RTP.

- November 9, 2022 – Bicycle and Pedestrian
- November 9, 2022 – Infrastructure
- December 1, 2022 – Transit
- December 7, 2022 – Environment, Sustainability and Climate Change
- December 8, 2022 - Pioneer Valley Commissioners

Each focus group was held virtually and consisted of a facilitated discussion guided by a series of polls. Comments received as part of the focus groups were used to update the vision, goals, needs, strategies and problem statements for the RTP. This draft version was distributed to the JTC, MPO, and through the PVPC website in February 2023 to continue to solicit comments.

A series of RTP informational products were developed beginning in the fall of 2022 to begin outreach efforts and education on the RTP process. These products are summarized below:

- RTP Webpage -
- RTP Overview Presentation - <http://pvmpo.pvpc.org/wp-content/uploads/2023/02/RTP-Overview-for-web.pdf>
- RTP Informational Brochures in multiple languages
- RTP Survey

All products were made available on the dedicated webpage for the RTP update. A copy of the RTP brochure and survey have been included as part of the appendix to this document.

A. LOCAL FARMERS MARKETS OUTREACH

Local Farmers Markets were identified as a way to conduct public outreach on the RTP. PVPC staff identified a number of existing farmers markets and worked with the JTC and MPO to coordinate the locations and extent of outreach. The locations are shown in Table 3-1.

Table 3-1 – Farmers Market Outreach Events

Date	Farmers Market
September 17, 2022	Amherst Farmers Market
September 27, 2022	Springfield Forest Park Farmers Market
October 2, 2022	Easthampton Farmers Market
October 4, 2022	Northampton Farmers Market
October 6, 2022	Westfield Farmers Market
October 15, 2022	Holyoke Farmers Market

All of the Farmers Markets were held outdoors and occurred on different days of the week. PVPC staff set up a booth and display at each of the six markets and were available to interact with patrons of the market to answer their questions and concerns regarding regional transportation. An icebreaker question of “What do you think of when you hear the word transportation?” was used to initiate a conversation. A brief survey in both digital and paper format was also developed to ask additional questions. The surveys were made available in English, Spanish, Russian, and Vietnamese. The MassDOT ENGAGE Tool was used to help identify languages

other than English that might be spoken in the communities where the Farmers Market was located. A total of 295 surveys were recorded.

1. Word Clouds

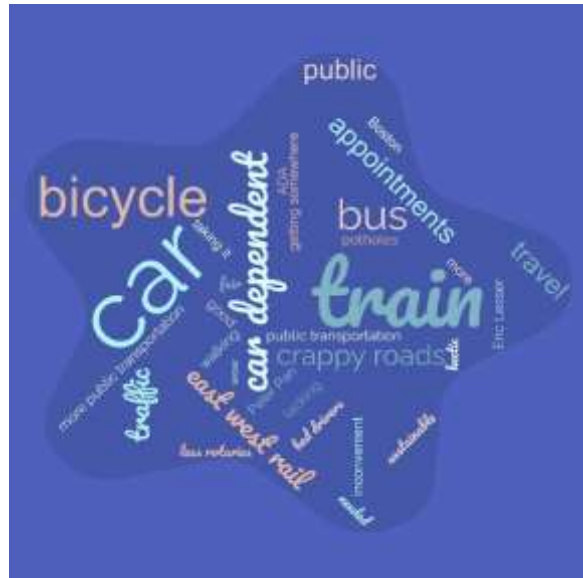
Responses received as part of the icebreaker question “What do you think of when you hear the word transportation?” were summarized into Word Clouds to compare and contrast public opinions on transportation at each Farmers Market. This information is summarized in Figures 3-1 and 3-2.

Figure 3-1 – Word Clouds by Farmers Market

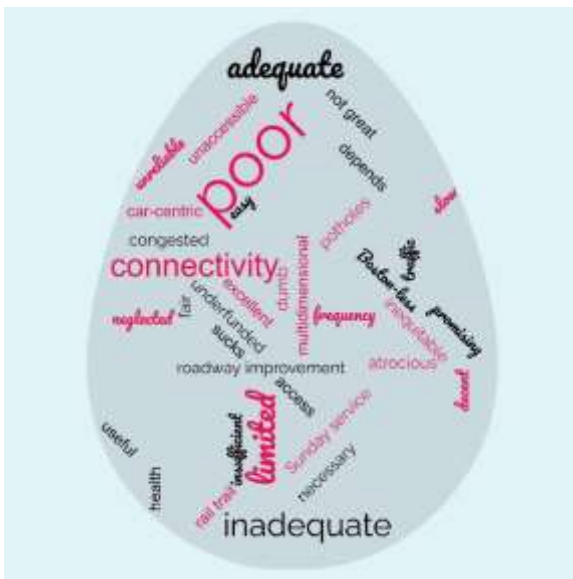
Amherst Farmer’s Market



Springfield Farmer’s Market



Easthampton Farmer’s Market



Northampton Farmer’s Market



Westfield Farmer's Market

Holyoke Farmer's Market



Figure 3-2 – Summary Word Cloud of all Farmers Markets



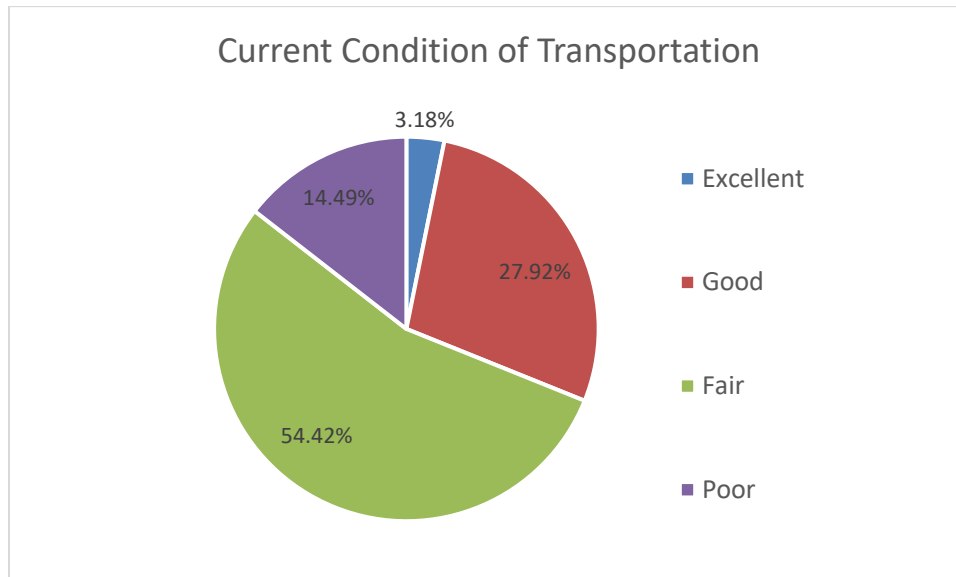
In comparing the Word Clouds, there are many common themes. Many people responded with their favorite mode of transportation or how they viewed the current state of transportation conditions. There was a real desire for more connectivity between transportation modes and more options for public transportation. A number of people also expressed a strong desire for more passenger rail service.

Notable differences in responses were observed in the Easthampton Word Cloud that included many words with a negative focus. The Northampton Word Cloud is dominated by the current expense of transportation and the Amherst Word Cloud prioritizes the need for more bus service.

2. Survey Responses

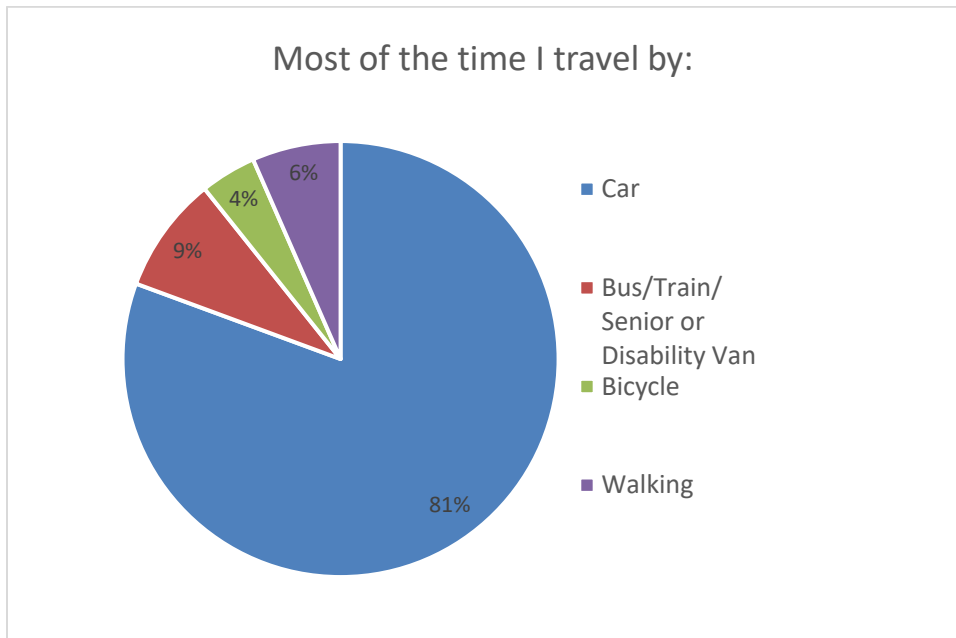
A brief six question survey was developed for use at the Farmers Markets. A complete copy of the survey is included in the Appendix to the RTP. A summary of three questions is shown on Figures 3-3 – 3-5.

Figure 3-3 – Summary of Farmers Markets Survey Responses



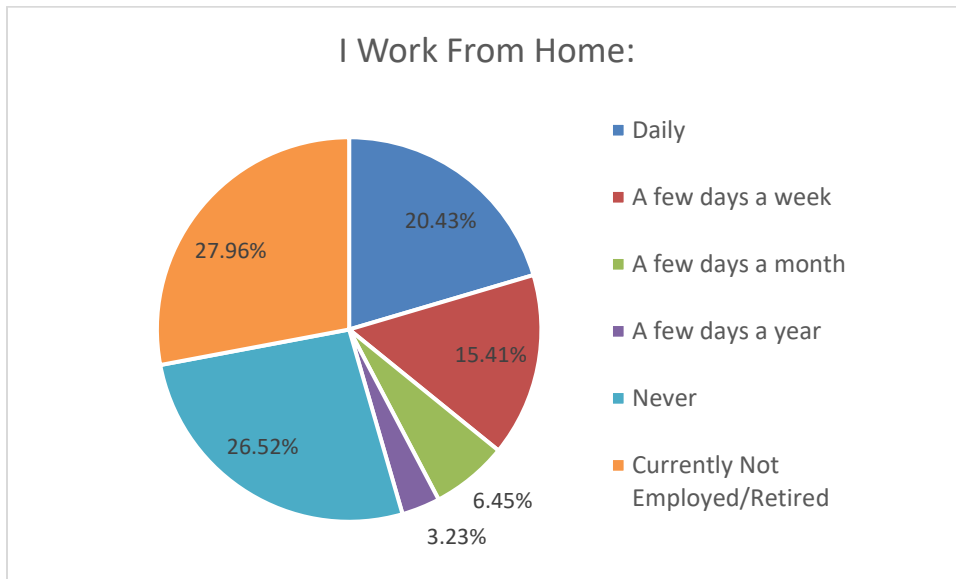
Nearly 83% of survey respondents felt the regional transportation system was in good or fair condition. Almost 15% of responses indicated the system was in poor condition while only just over 3% of responses were recorded as excellent.

Figure 3-4 – Preferred Mode of Travel



Over 80% of respondents prefer to travel by car. Bus, train and senior van was the next highest mode of travel followed by walking and biking.

Figure 3-5 – Frequency of Working from Home



Over 35% of the respondents reported they currently work from home at least 1 day per week. This is a large increase from the data reported from the 2017 American Communities Survey where 4% of Hampden County residents and 7% of Hampshire County residents reported they work for home.

Respondents were also asked to rank a list of six transportation improvement categories from most important to least important based on how they would prioritize transportation funding in the RTP. This information is summarized in Table 3-2.

Table 3-2 - What Type of Projects Should be Included in the RTP?

Transportation Improvement Project Category	Score
Funding necessary maintenance of roads and bridges.	4.45
Improve bicycle path network connections and amenities for riders and pedestrians.	3.71
Fund operation and maintenance of our regional transit system.	4.00
Add more train trips to the east-west passenger rail service to connect the Pioneer Valley region in the west with Boston in the east.	4.25
Implement projects that help reduce roadway crashes causing fatalities and serious injuries.	3.40
Remove physical and visual barriers to the Connecticut River and Riverwalk in Springfield by redesigning the raised highway at that section of the Interstate I-91 Viaduct.	1.96

The most popular response was “Funding necessary maintenance of roads and bridges” however there was no clear dominant preference as scoring was fairly close between the first 5 choices. Only the proposed redesign of the I-91 Viaduct received a low level of interest indicating it may not have as much regional appeal as the rest of the choices.

B. RTP OUTREACH

PVPC reached out to local groups and organizations to give a presentation on the RTP. Table 3-3 summarizes the outreach on the RTP.

Table 3-3 – RTP Outreach Events

Date	Event
Monthly	Pioneer Valley Joint Transportation Committee Meetings
Monthly	Pioneer Valley Metropolitan Planning Organization Meetings
November 5, 2022	Gujarati Association of Western Massachusetts Diwali Party
November 10, 2022	Pope Francis High School Career Day
January 5, 2023	Amherst Transportation Committee (Joint event with MassDOT)
January 12, 2023	Western Massachusetts Transportation Advocacy Network Meeting (Joint event with MassDOT and FRCOG)

C. DRAFT RTP

The PVPC utilized existing committees such as the Joint Transportation Committee, Pioneer Valley Commissioners, and Pioneer Valley Metropolitan Planning Organization to provide routine status updates in the development of the Draft RTP. A brief presentation on the RTP was given, and comments received as part of the meeting were incorporated into the Draft RTP. The monthly JTC meetings were particularly useful to receive feedback from local communities on the content of the RTP.

Environmental consultation occurred on Wednesday May 3, 2023 to allow the opportunity for discussion and comment on the potential environmental impacts of transportation projects included in the regional transportation plan. This process is summarized in Chapter 17.

The Pioneer Valley MPO released the Draft 2024 RTP on June 27, 2023. Comments were accepted until July 21, 2023. Paper and electronic copies of the Draft RTP were made available during the formal public participation process on request. The Draft RTP was available for download from PVPC's web page at <http://www.pvpc.org>. All written comments received on the Draft RTP are included in Table 3-1.

1. Draft RTP Outreach

PVPC held a virtual meeting on June 28, 2023 at 6pm for the purpose of collecting feedback on the Draft RTP. This meeting was recorded and made available through the PVPC website. Two virtual sessions to address questions and comments on the Draft RTP were scheduled on Wednesday, July 12, 2023, from 1:00 – 2:00 PM and Tuesday, July 18, 2023, from 6:00 – 7:00 PM.

Additional in-person events were scheduled immediately prior to and during the formal RTP public participation process as follows:

- Cultural Chaos Easthampton – June 10, 2023 from 12pm-5pm
- Huntington Transfer Station - June 24, 2023 from 8am to 11am
- Armour Yard Holyoke - July 17, 2023 from 5pm to 8pm

Event summaries are provided in the RTP Appendix to add additional context based on staff conversations with attendees that did not wish to submit a formal written comment.

Table 3-4 – Comments Received on the Draft RTP

Comment Ref. #	Comment	From	MPO Response
1	Please include a self-certification statement for endorsement by the MPO.	MassDOT	To be included in final document
2	Please include a GHG certification statement for endorsement by the MPO.	MassDOT	To be included in final document
3	Please consider adding legend/key to the figures in Chapter 4 that currently have none. Please consider updating the legend/key in Figures 4-6 and 4-7, as it is quite pixelated and difficult to read. When referencing REJ+ Populations in Table 4-1, please consider including a brief description on the factors incorporated here.	MassDOT	Additional Clarifying information will be included as part of the final report.
4	Please add a line for Secretary Fiandaca's signature to the Endorsement sheet on page 245.	MassDOT	To be included in final document
5	Please include acronyms list in the appendix, it can be copied directly from the TIP/UPWP.	MassDOT	To be included in final document
6	Please consider adding a funding sources section in the appendix, which can be copied from the recent TIP document or using the link below. https://www.mass.gov/doc/stip-ffy-2023-2027-appendix-funding-category/download	MassDOT	To be included in final document
7	Please update the target years for PM2 to 2024 (2-Year) and 2026 (4-Year), and in Table 12-6 for PM2 and PM3. Please also update the PM3 targets in Table 12-3 to the latest targets from the PM Narrative, attached via email.	MassDOT	To be updated in final document
8	I agree with Secretary Card’s letter of determination, focusing on “electrify everything” (buildings and vehicles) and “green the grid” and am glad that PVPC is advancing projects consistent with this vision.	Josh Knox, Holyoke resident	Comment noted.
9	Valley Bike was great! I hope a new vendor can be found!	Josh Knox, Holyoke resident	Comment noted.
10	Chapter 11, page 2. this bullit point is repeated: In 2021 and 2022, then Governor Baker signed comprehensive climate change legislation that codified into law Massachusetts commitment to reach Net Zero.	Josh Knox, Holyoke resident	Duplicate text will be corrected for the final document.
11	I appreciate reference to "also referred to as the Greater CT River Valley" as I understand the reference to Pioneer is offensive to native folx who have been subject to centuries of colonization	Josh Knox, Holyoke resident	Comment noted.

Comment Ref. #	Comment	From	MPO Response
12	Hooray for Complete Streets!	Josh Knox,	Comment noted.
13	Chapter 11, page 9: I think these MVP stats need to be updated? Shouldn't 2022 applicants be known, not "preparing to apply?"	Josh Knox, Holyoke resident	Staff will review the status of the MVP applications and include the best updated status as part of the final report.
14	Chapter 11, page 12: have we given up on PV arrays in new parking lots as a policy recommendation? I would advocate for including this recommendation here.	Josh Knox, Holyoke resident	Staff will review current/best practices in this area and incorporate an additional recommendation as part of this Chapter.
15	We need direct buses between SPR and BOS	Doris Madsen	Comment noted.
16	I am putting in a plug for an electric charging station in the parking lot at Jones Ferry - near the river so we can use it to charge our batteries for our electric motor for our coaching launch as well as cars and bikes. Let me know if I should do more and where to pursue this.	Stephanie Moore - Director, Holyoke Rows	Staff will forward some resources/information on how to pursue an electric vehicle charging station.
17	What would it take to turn PVRTA into a proper public transit system that people can actually use? Right now it doesn't go anywhere we need to go when we need to go there. Also lets get ValleyBike share back online.	Luke Jaeger	Comment noted.
18	We are strongly in support if extended train service Northampton to Boston, We would use this on a regular basis.	Suzanne Love - FNTG, MNA	Comment noted.
19	Would love to see this rail from Pittsfield to Boston. Rte. 90 was never intended for the amount of traffic today + needs a commuter lane or parkway.	Heather Ruel - Granby resident	Comment noted.
20	I live in Northampton, MA and grew up in Western MA (hilltowns) and it would be wonderful if there were more frequent train trips to Boston. My family and friends would use the train if it was feasible to travel in for the day. Thanks for helping Western MA get more equitable public transportation.	Sinead Keogh	Comment noted.
21	I live in Northampton and sometimes need to commute to Boston for work. The current level of service - one daily Amtrak from Springfield is laughable! We can do so much better. Let's connect the Pioneer Valley to the rest of Boston with ideally hourly trains that take less than 2 hours. Our economy, wallets, and the climate will benefit!	Taylor Guss	Comment noted.
22	We needs more runs for commuters and underserved areas. I am for this expansion.	K. Pielian	Comment noted.

Comment Ref. #	Comment	From	MPO Response
23	Extend the rail trail to Holyoke and Springfield! Bus/Commuter train north to Greenfield/Turners at regular working hours (9 AM - 5 PM)	Tess Patricia - Easthampton resident	Comment noted.
24	Call it West-East rail! Very in favor. Can't wait for this to actually happen.	Lena Strode - Easthampton resident	Comment noted.
25	RE: East/West Rail. If you want maximum ridership you've got to save people time. Pay to make it as fast as possible.	Stuart H. Krantz - Williamsburg resident	Comment noted.
26	I commute to Boston daily. It would be great if this happened a decade ago, but oh well. I suggest when you break ground - start in Worcester. That would already start lowering the commute from Western MA into Boston. Good Luck!	Ellen Wzioutka	Comment noted.
27	We support east-west rail strongly! It would be beneficial to western and eastern MA.	Dave Potter - Northampton resident	Comment noted.
28	We live in western MA and would like to see this east/west route developed ASAP! It would be a huge help and encourage more travel, commuting, and business opportunities! Please do this route ASAP.	Melissa Lake	Comment noted.
29	Regular east/west rail is a necessary option for travel. The turnpike is way overtaxed by traffic. I need to visit Boston hospitals regularly as a heart transplant patient. An east/west parkway would also ease the traffic.	David Mazulowski	Comment noted.

4. EQUITY

A. BACKGROUND

The Pioneer Valley Planning Commission (MPO) is required to certify to the Federal Highway Administration and the Federal Transit Administration that their planning process addresses the major transportation issues facing the region. This certification assures that planning is conducted in accordance with Title VI of the Civil Rights Act of 1964, and requirements of Executive Order 12898 (Environmental Justice). Under the provisions of Title VI and Environmental Justice PVPC works to assess and address the following:

Civil Rights Act of 1964, Title VI: " No person in the United States shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Executive Order 12898, Environmental Justice: "Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing as appropriate disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Justice40 14008: "The Justice40 Initiative confronts decades of underinvestment in disadvantaged communities and brings resources to address gaps in transportation infrastructure and public services by working toward the goal that at least 40% of the benefits from grants, programs, and initiatives flow to disadvantaged communities. Justice40 will increase affordable transportation options that connect Americans to good-paying jobs, fight climate change, and improve access to resources and quality of life in communities by identifying and prioritize projects that benefit rural, suburban, tribal, and urban communities facing barriers to affordable, equitable, dependable, and safe transportation. Justice40 will also assess the negative impacts of transportation projects and systems on disadvantaged communities and will consider if local communities have been consulted in a meaningful way during the project's development."

The U.S. Department of Transportation (USDOT) issued a DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations in 1997. It identifies environmental justice as an "undeniable mission of the agency" along with safety and mobility. USDOT stresses three principles of environmental justice:

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

B. TRANSPORTATION EQUITY

The Pioneer Valley Planning Commission has been collaborating with Pioneer Valley Transit Authority (PVRTA), MassDOT, Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on addressing the principles of Title VI and Environmental Justice in the transportation planning process for the Region. The primary tasks include:

1. Identifying Minority and Low-Income Populations

Develop a demographic profile of the Pioneer Valley Region that includes identification of the locations of socio-economic groups, including low-income and minority populations as covered by the Executive Order on Environmental Justice and Title VI provisions.

2. Public Involvement

Create a public involvement process that identifies a strategy for engaging minority and low-income populations in transportation decision making, and routinely evaluate this strategy for its effectiveness at reducing barriers for these populations.

3. Service Equity

Institutionalize a planning process for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups. Develop an on-going data collection process to support the effort and identify specific actions to correct imbalances in the RTP, TIP and Transit funding.

C. IDENTIFICATION OF MINORITY AND LOW-INCOME POPULATIONS AND TARGET POPULATIONS

Strategy - Identifying minority and low-income populations using Census data. Review EJ population thresholds and assessment methods from other regions and select a definition that provides the best representation for minority and low-income populations in the Pioneer Valley.

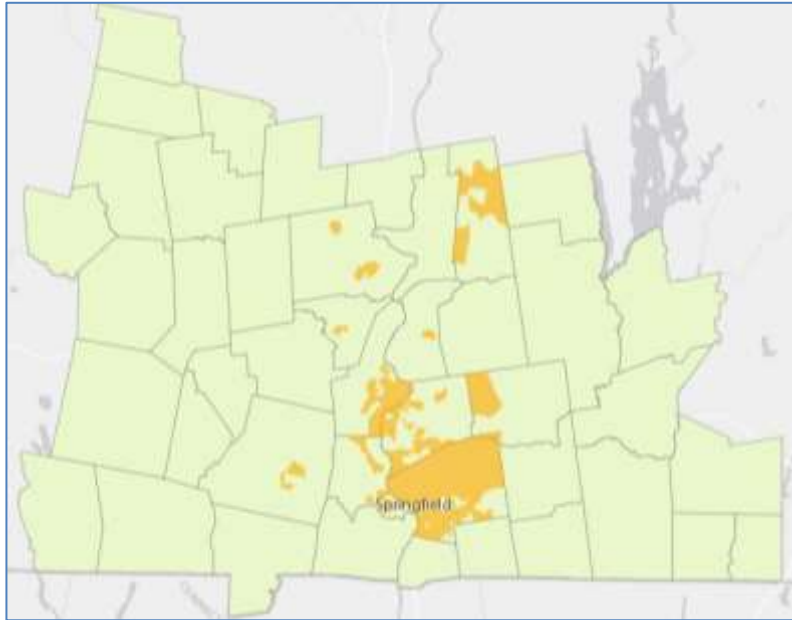
The equity performance measures developed in subsequent sections of the plan are dependent on an accurate definition of the "target population." The forty-three communities of the Pioneer Valley Region are diverse in incomes and ethnicity. The region's urban cores of fourteen communities comprise most of the population and 90 percent of the jobs. To establish the most effective measure of equity, PVPC staff reviewed EJ plans from similar Metropolitan Planning Organizations in other parts of the country. The definition used to define "target populations" in each of these plans was scrutinized and evaluated based on its applicability to our region. From these plans, eight different population definitions for low income and minority populations were singled out for review in Pioneer Valley. PVPC actively solicited additional feedback and input from stakeholders in the region.

1. Minority Populations

The PVMPO defines "minority" as "the population that is not identified by the census as White-Non-Hispanic" in the ACS (ACS 2016-21). Under this definition, minority persons constitute 23.48% of the region's population. The racial or ethnic groups included are:

- White Non-Hispanic
- African American or Black
- Hispanic or Latino (of any race)
- Asian (including Native Hawaiian, & other)
- American Indian (& Alaska Native)
- Some other race
- Two or More Races

Figure 4-1 - Minority Populations Exceeding Regional Average of 23.48%

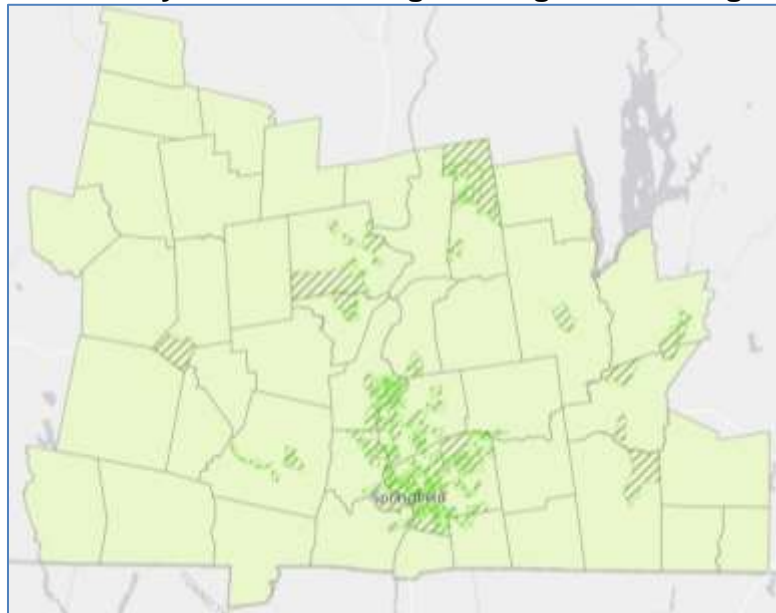


Source: ACS 2016-21, for a larger version of this map visit:
<https://pvpc.maps.arcgis.com/apps/webappviewer/index.html?id=d124416bed674650bf51c65b6dd6abe4>

2. Identification of Low-Income Populations

The PVMPO defines a “low income” area using census block group data. Any block group with a proportion of people in that block group living at or below the federally defined poverty level that exceeds the proportion of people in poverty in the region, which is 14.62 percent is defined as “low income.”

Figure 4-2 - Poverty Rate Exceeding the Regional Average of 14.62%



Source: ACS 2016-21

D. IDENTIFICATION OF PERSONS WITH DISABILITIES POPULATIONS

Transportation and mobility play key roles in the struggle for civil rights and equal opportunity in the disability community. Affordable and reliable transportation allows people with disabilities access to important opportunities in education, employment, health care, housing, and community life. People with disabilities—particularly in rural areas— need accessible, affordable transportation options that bring employment, health care, education, housing, and community life within reach. PVPC used the Census definition of employed persons with a disability between ages 21-64, and those sixty-five and older, using the American Community Survey (ACS 2016-21) block level estimates.

Figure 4-3 - Census Block Groups- Individuals Aged 21-64 with Disabilities

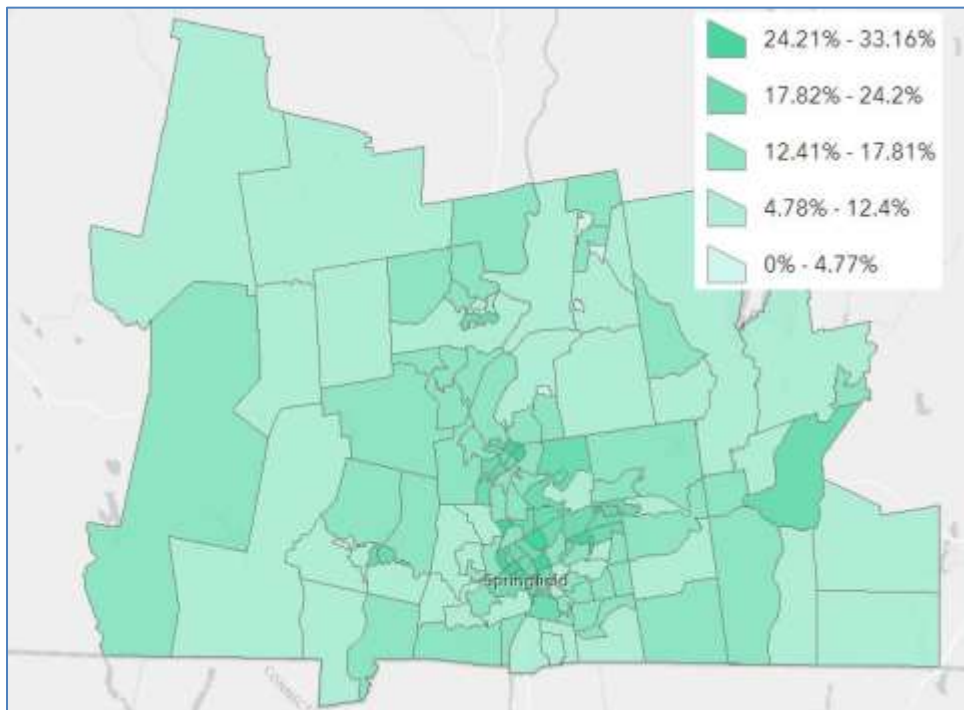
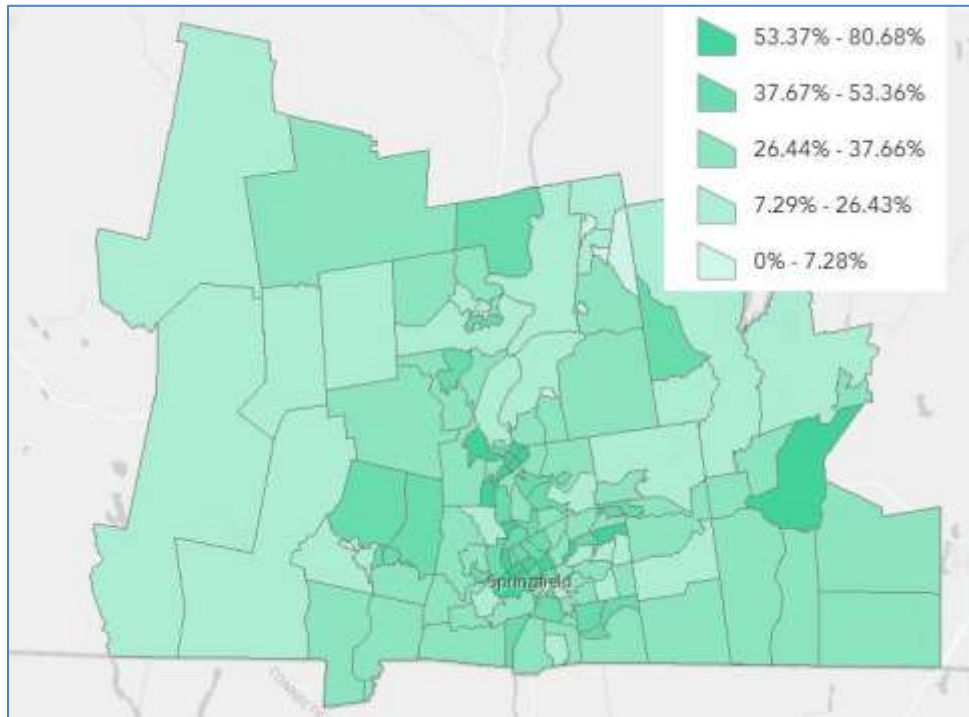


Figure 4-4 - Census Block Groups Individuals Age 65+ with Disabilities



E. CONSULTATION AND PUBLIC ENGAGEMENT

In accordance with state and federal law requirements, and to ensure inclusive and accessible public engagement processes for transportation decision making, the Pioneer Valley MPO developed a Public Participation Plan (PPP) to guide agency public participation efforts to include those populations that have been underserved by the transportation system and/or have lacked access to the decision-making process. The PPP guides the MPO in its efforts to offer early, continuous, and meaningful opportunities for the public to help identify social, economic, and environmental impacts of proposed transportation projects and initiatives. The Plan was developed in collaboration with MassDOT in 2022. The PPP defines how public participation is incorporated into its transportation decision-making processes, and how the MPO ensures access for people with disabilities and the inclusion of low income and minority stakeholders.

Specifically, the PPP states the methods that MPO will use to engage and involve the public and persons who are low-income, minority, of Limited English Proficient (LEP), or have a disability, and other traditionally underrepresented populations. Because different transportation decisions to be made require different techniques for reaching the public, this Plan provides a toolbox of techniques to be applied, as appropriate, to achieve effective participation.

The Public Participation program was developed around a process that includes outreach to representatives of the target populations. The Pioneer Valley Planning Commission has a working relationship with representatives of minority, low-income populations, advocacy groups representing walking and bicycling, and organizations representing persons with disabilities. The Plan for Progress, the Urban Investment Strategy Team, and the Welfare to Work Program and Regional Comprehensive Land Use Plan have created relationships with opened lines of communication into the needs and issues of minority and low-income populations.

1. Engaging the Community in the Planning Process

The MPO utilizes several methods of communicating with the public. These methods include messaging on Constant Contact, social media (Twitter, Facebook, and YouTube), the PVMPO's website, through board meetings and committee meetings, virtual meetings, stakeholder outreach, and in-person public events. The dissemination of Title VI information is associated with this outreach and other MPO activities by referencing Title IV in meeting notices, documents, agendas, and formal actions items at JTC and MPO meetings. The MPO's website is the main repository for documentation of the MPO's Title VI Program and related information. Vital documents are translated into Safe Harbor Languages and the MPO is working to post documents in both PDF and HTML. The web site was revised in 2022 specifically to make Title VI resources and documentation more visible and more accessible and to enable Google translations into dozens of languages. Materials can be requested in accessible formats by email, telephone, or US mail. All MPO public documents contain the full or abbreviated notice of nondiscrimination, notification that translations are available upon request, and that accessible accommodations can be made available upon request. In-person meeting locations for the MPO have wall mounted board with the notice of nondiscrimination (in seven languages). The MPO maintains email distribution lists including Joint Transportation Committee, and a Transportation Equity contact list comprised of community-based organizations and nonprofits including organizations and individuals representing traditionally underserved populations. These email lists are used to keep the public informed of opportunities to participate in the planning process. Translations for vital documents are available in accordance with the MPO's Language Access Plan and these translated documents include translated versions of the notice of nondiscrimination and the ability to request translated and accessible versions of documents.

The PVMPO is engaged with a wide range of community-based organizations that serve LEP persons through participation in meetings of organizations and

agencies that deal with LEP issues and through public outreach activities. PVMPO staff participates on an ongoing basis in the meetings and activities of the community and municipal organizations. Other regularly scheduled coordination efforts include:

- Pioneer Valley Joint Transportation Committee Meetings
- Pioneer Valley Planning Commission Meetings
- Pioneer Valley JTC Bicycle and Pedestrian Advisory Committee
- Springfield Built Environment Meeting
- WalkBike Springfield meeting

PVPC staff develop and employ a strategic public engagement process with an open approach to engage, inform, and involve people of all backgrounds in the decision-making process. Guiding principles in this public engagement process include:

2. Promote Respect

All transportation constituents and the views they promote should be respected. All feedback received should be given careful and respectful consideration. Members of the public should have opportunities to debate issues, frame alternative solutions, and affect final decisions.

3. Provide Initiative-taking and Timely Opportunities for Involvement

Avenues for involvement should be open, meaningful, and organized to let people participate comfortably, taking into consideration accessibility, language, scheduling, location, and the format of informational materials. Meetings should be structured to allow informed, constructive dialogue, be promoted broadly and affirmatively; and be clearly defined in the initial stages of plan or project development. Participation activities should allow for early involvement and be ongoing and initiative-taking, so participants can have a fair opportunity to influence PVMPO decisions.

4. Offer Authentic and Meaningful Participation

The MPO should support public participation as a dynamic and meaningful activity that requires teamwork and commitment at all levels. Public processes should provide participants with purposeful involvement, allowing useful feedback and guidance. Participants should be encouraged to understand and speak with awareness of the many competing interests, issues, and needs that lead to transportation ideas and projects.

5. Provide a Clear, Focused, and Predictable Process

The participation process should be understandable and known well in advance. This clarity should be structured to allow members of the public and officials to plan their time and use their resources to provide input effectively. Activities should have a clear purpose, the intended use of input received made clear, and all explanations described in language that is easy to understand.

6. Foster Diversity and Inclusiveness

The MPO should proactively reach out to and engage people with disabilities, as well as low-income, minority, limited English proficient disabled and other traditionally underserved populations.

7. Be Responsive to Participants

PVMPO meetings should facilitate discussion that addresses participants' interests and concerns. Scheduling should be designed to meet the greatest number of participants possible and be considerate of their schedules and availability.

8. Record, Share and Respond to Public Comments

Public comments, written and verbal, should be given consideration in the MPO decision making processes and reported in relevant documents.

F. EQUITY ASSESSMENT MEASURES

1. Equity Assessment Strategies

Title VI and the executive orders of Environmental Justice and Justice40 call for programs that quantify the benefits and burdens of transportation investments and evaluate the impacts for different socio-economic groups. To accomplish this task PVPC worked with the JTC to establish measures of effectiveness that would reflect quantifiable transportation expenditures in the Region. These measures were used to evaluate capital expenditures in the Regional Transportation Plan and Transportation Improvement Program and to evaluate transit service. The evaluations provide a barometer of the distribution of resources and assist decision-makers in achieving an equitable balance in future years.

2. Environmental Justice Plus (EJ+ Plus)

A Regional Environmental Justice "Plus" (REJ+) is a designation assigned to block groups with relatively high shares of residents that are especially impacted by changes in or to transportation networks. This designation is 'regional' in nature because the socioeconomic characteristics that designate REJ+ status are considered in relation to regional percentiles(through

comparing block group characteristics to metropolitan planning organization-level percentiles rather than statewide percentiles); the designation is called 'plus' because we have included characteristics beyond traditional 'environmental justice' definitions in order to identify the 'most dominant factor' that defines a community's social vulnerabilities. For an expanded description of REJ+ please visit:

<https://www.pvpc.org/sites/default/files/files/REJ%2B%20Project%20Description%20031923.pdf>

To qualify as an REJ+ community, a block group must meet at least one of the following thresholds that correspond to traditional environmental justice criteria:

- Income: Annual median household income \leq MPO 25th percentile.
- Race and ethnicity: Percent of individuals that identify as Hispanic or Latino; Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; Some other race; or Two or more races and do not identify as White alone \geq MPO 75th percentile.
- Limited English proficiency (LEP): Percent of households with limited English-speaking members \geq MPO 75th percentile.

We identify the 'most dominant factor' that drive transportation and accessibility needs in each community and we also include the following characteristics for this specific determination:

- Car ownership: Percent of households without an available vehicle \geq MPO 75th percentile.
- Disability: Percent of households with one or more persons with a disability \geq MPO 75th percentile.
- Age: Percent of individuals aged 65 or older \geq MPO 75th.

3. Equity Distribution Analysis

Information collected from census data, GIS, transit route inventory, and regional models was used to identify and assess transportation deficiencies, benefits, and burdens. The evaluation of each measure of effectiveness included the following:

a) Distribution of Transportation Investments in the Region

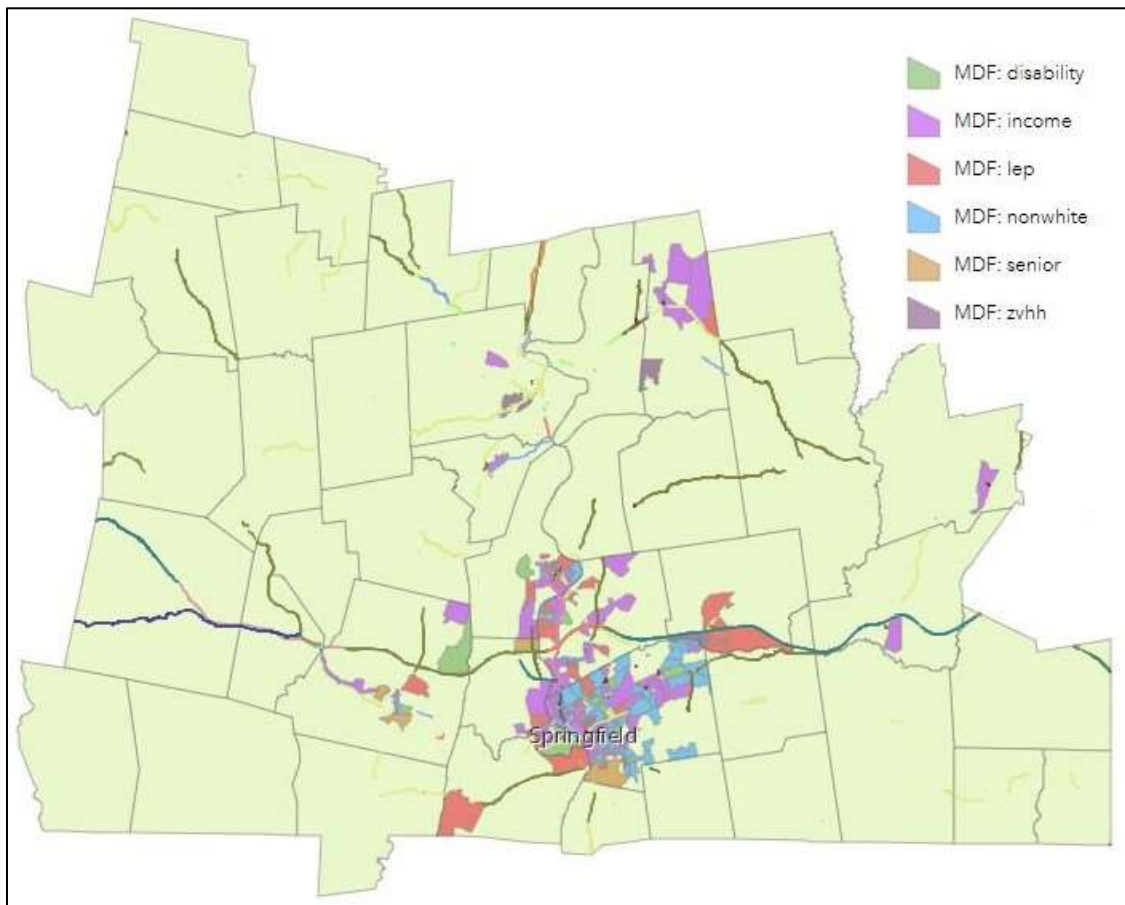
PVPC completed an inventory of projects included on the RTP and mapped these projects. GIS tools were used to determine the amount of transportation funds (including bridge and transit projects) allocated to Environmental Justice populations and compared these values to regional average allocations using census block group data. The RTP analysis is presented in Table 4-1 and Figure 4-5.

The analysis shows that 47.64 percent of projects on the RTP are in environmental justice populations and that 52.36 percent of projects are in other block groups.

Table 4-1 – RTP REJ+ Project Analysis

	PVPC Total	REJ+ Block Groups	Other Block Groups	% PVPC Total REJ+ Block Groups	% PVPC Total in Other Block Groups
Transportation Analysis Zones (Block Groups)	444	176	268	39.64%	60.36%
Population	628,075	222,726	405,349	35.46%	64.54%
Number of Projects	176	68	108	38.64%	61.36%
Projects	\$1,378,012,771	\$656,456,375	\$721,556,396	47.64%	52.36%
Total Project Dollars per Capita	\$2,194	\$2,947	\$1,780		

Figure 4-5 - Distribution of Projects in the RTP to EJ+Plus Populations



b) Attainability by Transit

The level of attainability by transit describes regional accessibility by transit riders of the Pioneer Valley. These populations usually depend on local public transit to reach necessary regional amenities such as health care, food stores, education, employment, and housing. Groups that disproportionately depend on public transit include low-income populations, people of color, immigrants, the elderly and disabled. Accessibility for these groups, as well as for the general population, was mapped against the regional transit network.

This analysis examines transit accessibility throughout the Pioneer Valley region in terms of access to jobs and services, and in terms of access from populations and households. A hexagonal grid was created covering Hampshire and Hampden counties with over 30,000 cells, each with a 200-meter radius. Travel ranges were then calculated for the centroid of each cell, assuming a one-hour travel time via transit and walking, with a start or end time (depending on direction of travel) of 5:00PM, based on weekday transit schedules during the academic year. The number of people, households, jobs, and other services and demographic data within each cell's travel range were then estimated using geospatial intersect and 2020 census data, and the results mapped for further analysis.

The maximum values for each mapped statistic were evaluated as percentages of the regional total, and to provide further context, subtotals for each statistic were also calculated based on 0.25- and 0.1-mile radii around bus stops. The results are presented below:

Table 4-2 - Transit Proximity and Accessibility

Statistic:	Pioneer Valley Region Total:	Within 0.25mi of PVTA Bus Stop:	0.25mi Percent of Total:	Within 0.1mi of PVTA Bus Stop:	0.1mi Percent of Total:	Maximum Accessible To Single Location:	Max Percent of Total:
Total Population	628,100	295,100	47%	142,900	23%	227,308	36%
Below Poverty Line	94,215	70,824	75%	40,012	42%	52,486	56%
Minority	219,835	159,354	72%	87,169	40%	134,413	61%
Living with Disability	94,215	50,167	53%	24,293	26%	42,073	45%
65+ Years Old	106,777	38,363	36%	15,719	15%	30,885	29%
17- Years Old	125,620	61,971	49%	31,438	25%	53,922	43%
Limited English	56,529	41,314	73%	22,864	40%	34,406	61%
Total Households	244,100	88,200	36%	37,300	15%	87,992	36%
No Car	26,851	16,758	62%	8,206	31%	16,440	61%
One Car	90,317	37,926	42%	16,412	18%	13,319	15%
Statistic:	Pioneer Valley Region Total:	Within 0.25mi of PVTA Bus Stop:	0.25mi Percent of Total:	Within 0.1mi of PVTA Bus Stop:	0.1mi Percent of Total:	Maximum Accessible From Single Location:	Max Percent of Total:
Total Jobs	218,500	145,600	67%	90,300	41%	96,321	44%
Hospitals	14	12	88%	8	57%	6	43%
Urgent Care	5	4	80%	3	60%	3	60%
Pharmacies	110	81	74%	56	51%	50	45%
Nursing Homes	64	36	56%	16	25%	23	36%
Schools	509	306	60%	168	33%	208	41%
Colleges	20	17	85%	12	60%	10	50%
SNAP Grocery	31	28	90%	23	74%	18	58%

In general, transit within the Pioneer Valley provides closer access to jobs and services than it does to general or specific populations. For the ten population/household statistics, 36-75% are within 0.25 miles of bus stops, whereas for the eight job/service statistics, 56-90% are within 0.25 miles of bus stops. Similar trends are observed at the smaller 0.1-mile radius.

Among the general population, transit proximity is highest for those in poverty (75% live within 0.25 miles of a bus stop, 42% within 0.1 miles), followed by those with limited English proficiency (LEP) and then minority populations (73% and 72%, respectively, within 0.25 miles of a bus stop). Sixty-two percent of households without a car are located within 0.25 miles of a bus stop.

Among the general population, transit proximity is lowest for those 65 or more years old (36% live within 0.25 miles of a bus stop, 15% within 0.1 miles), followed by those seventeen or fewer years old (49% within 0.25 miles, 25% within 0.1 miles). A slight majority (53%) of people with disabilities live within 0.25 miles of bus stops.

Transit access peaks at just over 60% of the regional totals: 61% of minority populations, LEP populations, and car-free households can get to a given location by transit and walking within one hour. For services, transit access is highest for urgent care facilities (60% accessible within an hour from a given location), followed by SNAP grocery stores (58% accessible).

The following maps are divided into two categories: population and services. The former includes total population, total households, and various characteristics of each; the latter includes jobs, hospitals, schools, and other services. Population maps show the percentage of the regional total that can access a given hex cell within one hour; services maps show the percentage of the regional total that can be accessed from a given hex cell within one hour.

For a larger version of Figure 4-6 please visit:

[https://www.pvpc.org/sites/default/files/files/updated figure III.jpg](https://www.pvpc.org/sites/default/files/files/updated%20figure%20III.jpg)

For a larger version of Figure 4-7 please visit:

[https://www.pvpc.org/sites/default/files/files/updated figure II.jpg](https://www.pvpc.org/sites/default/files/files/updated%20figure%20II.jpg)

Figure 4-6 - Accessibility from Population (max 36%) within 60 minutes

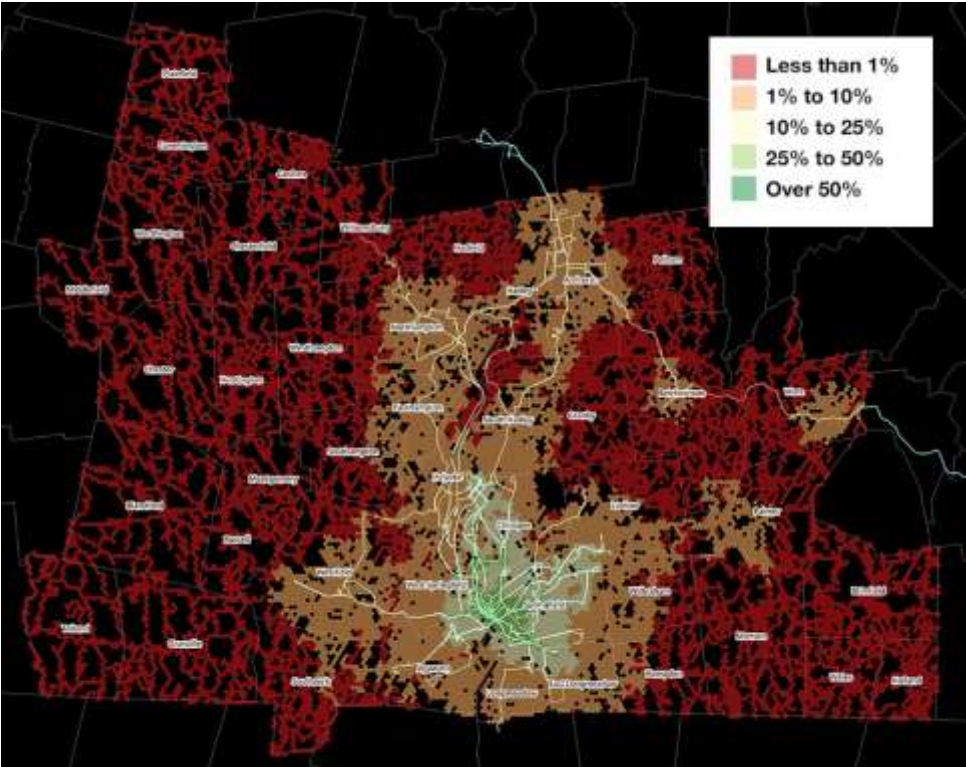
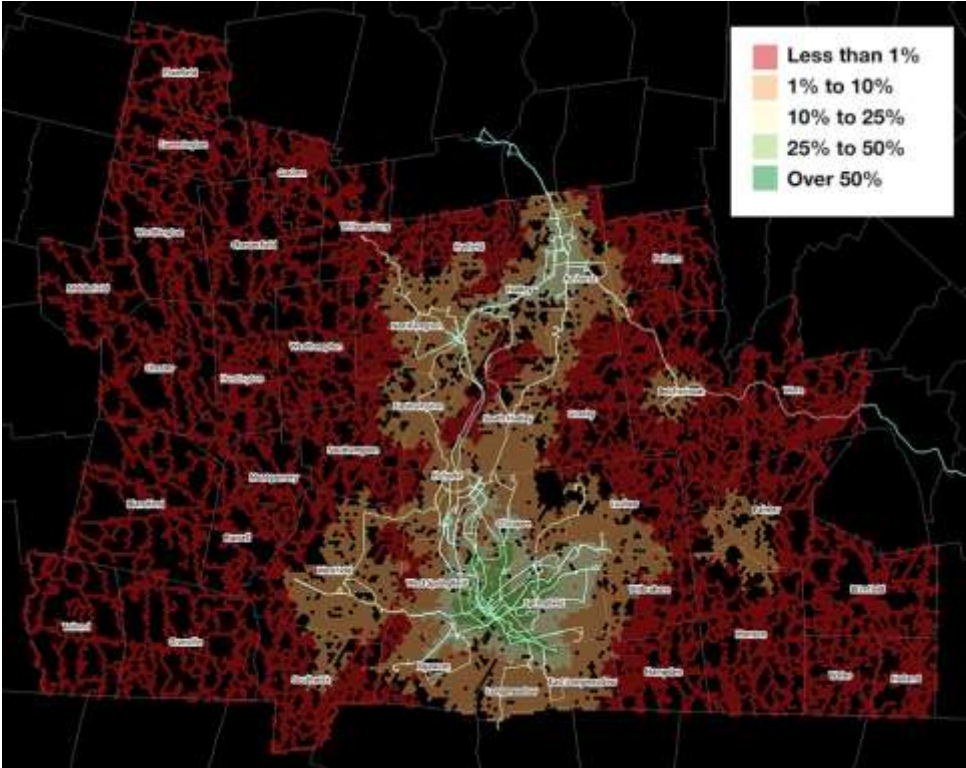


Figure 4-7 - Accessibility to Jobs (max 44%) within 60 minutes



Existing bus transit has the greatest reach in the Springfield area, where the greatest concentration of population and services exists. However, long travel times and infrequent schedules impede regional mobility, preventing the Springfield and Northampton/Amherst 60-minute catchment areas from overlapping to any great extent.

Public transit provides an important connecting service between major activity centers and residential locations in the Pioneer Valley. Minority, LEP, and low-income populations, as well as households without cars, have the best access to existing transit, while urgent care facilities and SNAP grocery stores are the most accessible amenities by existing transit. Transit access is weakest for households with only one car and for the population 65 years old or above, while nursing homes are the least accessible amenities by existing transit.

Overall, transit has low access, with maximum values of only 36-44% for total population, total households, and total jobs. Improvements in travel times, routing, and especially service frequency can improve accessibility. Prioritizing one-car households and 65+ populations should also be considered to address their particularly low accessibility rates.

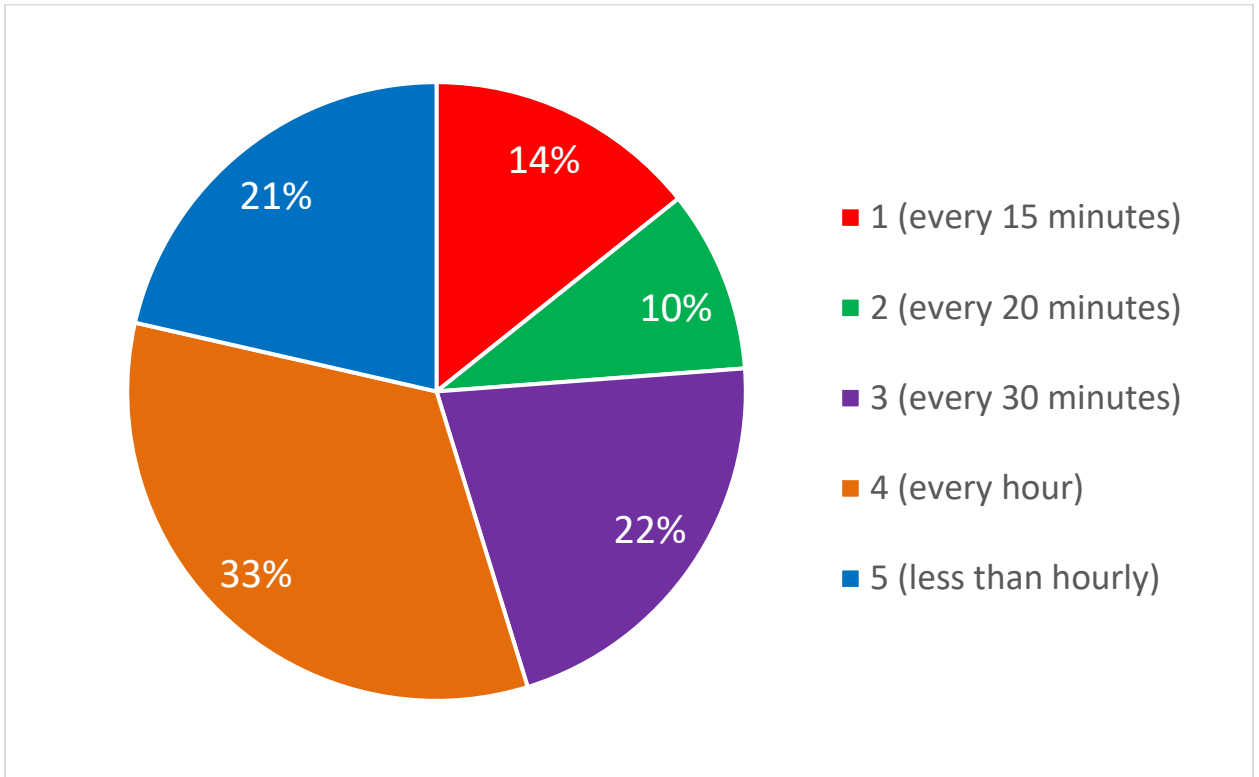
The bus routes connecting the Pioneer Valley have various levels of service ranging from regular to limited on weekdays, weekends, and during academic seasons. Several bus routes run reduced schedules during the summer and other academic vacation periods. The utility of bus routes is measured in terms of their typical weekday frequency, measured in terms of buses per hour. Each bus route is assigned to a service tier from 1 (best) to 5 (worst) depending on its frequency (Table 4-3 and Figure 4-8).

PVPC has included a task as part of its FFY2024 Unified Planning Work Program to advance a study of transit travel times based on different times of day. The public transportation planning software Remix will be used to evaluate and better understand who has access to transit, from where, to where, and how often based on demographic, operational, ridership, and origin-destination data.

Table 4-3 - Evaluation of Transit Service by Route

Route	Service Tier	Communities Served	Service Notes
B7	1 (every 15 minutes)	Springfield	
WSU	1 (every 15 minutes)	Westfield	Academic year service only
30	1 (every 15 minutes)	Amherst	Reduced service outside academic year
31	1 (every 15 minutes)	Amherst, Sunderland	Reduced service outside academic year
34	1 (every 15 minutes)	Amherst	Academic year service only
35	1 (every 15 minutes)	Amherst	Academic year service only
B6	2 (every 20 minutes)	Springfield, Ludlow	
G1	2 (every 20 minutes)	Springfield, Chicopee	
P20	2 (every 20 minutes)	Springfield, West Springfield, Holyoke	
B43	2 (every 20 minutes)	Northampton, Hadley, Amherst	Reduced service outside academic year
B4	3 (every 30 minutes)	Springfield	
G2	3 (every 30 minutes)	Springfield, East Longmeadow	
G3	3 (every 30 minutes)	Springfield	
P21	3 (every 30 minutes)	Springfield, Chicopee, Holyoke	
X90	3 (every 30 minutes)	Springfield, Chicopee, Holyoke, East Longmeadow	
B48	3 (every 30 minutes)	Northampton, Holyoke	Increased service outside academic year
33	3 (every 30 minutes)	Amherst, Hadley	
38	3 (every 30 minutes)	Amherst, Granby, South Hadley	Academic year service only
39	3 (every 30 minutes)	Northampton, Hadley, Amherst	Academic year service only
P21E	4 (every hour)	Springfield, Holyoke	
B17	4 (every hour)	Springfield	
B23	4 (every hour)	Holyoke, Westfield	
G5	4 (every hour)	Springfield, Longmeadow	
P11	4 (every hour)	Springfield, Holyoke	Academic year service only
R10	4 (every hour)	Springfield, West Springfield, Westfield	
R14	4 (every hour)	Springfield, West Springfield, Agawam	
R24	4 (every hour)	Holyoke	
X92	4 (every hour)	Springfield	
G73E	4 (every hour)	Springfield, Holyoke, Northampton	
39E	4 (every hour)	Northampton, Hadley, South Hadley	Academic year service only
R41	4 (every hour)	Northampton, Easthampton, Holyoke	
R42	4 (every hour)	Northampton, Williamsburg	
36	4 (every hour)	Amherst	Academic year service only
B12	5 (less than hourly)	Springfield, Ludlow	
R29	5 (less than hourly)	Springfield, Holyoke, South Hadley, Granby, Amherst	
B43E	5 (less than hourly)	Northampton, Amherst	Academic year service only
R44	5 (less than hourly)	Northampton	
45	5 (less than hourly)	Amherst, Belchertown	Reduced service outside academic year
46	5 (less than hourly)	Amherst, Sunderland, Deerfield	
B79	5 (less than hourly)	Amherst, Belchertown, Ware, W. Brookfield, Brookfield, E. Brookfield, Spencer, Leicester, Worcester	
NE	5 (less than hourly)	Northampton, Easthampton	
WP	5 (less than hourly)	Springfield, Wilbraham, Palmer, Ware	

Figure 4-8 – Percentage of PVTA Bus Routes in each Service Tier



In general, shorter trips between two adjacent locations can take advantage of routes with a high level of service throughout the day. On the other hand, longer trips connecting to more distant locations are subject to a combination of levels of service from each of the connecting transit routes. This can result in a lower overall level of service due to travel constraints posed by the lowest level of service category of a trip segment. Despite variations in frequency and coverage during summer or "No School" periods, most transit users continue to travel to work and other destinations regardless of season. This is a key factor to keep in mind when analyzing the overall transit attainability of individuals living in these locations because it affects their ability to engage in activities, acquire needed services, or seek employment.

Average travel time spent along each route to complete a trip is also of interest. Travel times durations may fluctuate at varying times of the day or days of the week due to variations in schedules. Variation in a route schedule can increase wait time between bus connections. There is also the potential increase in travel time due to traffic congestion on certain portions of the route during midday, on Friday afternoons, and during traditional rush hour times. This makes taking a bus trip more time efficient during certain times of the day or on certain days of the week.

c) Equity Analysis of PVTA Comprehensive Fare/Service Changes

In 2019 PVPC conducted an equity analysis of proposed changes to the PVTA transit service in the region. This service equity analysis was prepared to meet the requirements of Title VI of the Civil Rights Act of 1964 in 49 CFR Section 21.5(b)(2), 49 CFR Section 21.5(b)(7), and Appendix C Section 3 to 49 CFR part 21, and in accordance with the guidance in Federal Transit Administration Circular 4702.1B of October 1, 2012.

Changes to PVTA's fixed route bus services were necessary to reduce operating costs and balance the agency's FY2019 budget. The equity analysis was designed to determine whether proposed service changes would have a discriminatory impact regarding race, color, income, or national origin. A demographic analysis of PVTA customers affected completed to determine whether there are adverse or disproportionate burdens on minority or low-income populations in the PVTA service area, as well as the types of measures that are likely to be effective and appropriate in mitigating adverse impacts on those transit customers.

A separate Title VI Fare Equity Analysis was completed and presented to the PVTA Advisory Board as required by federal guidelines and PVTA policies.

d) Distribution of UPWP Tasks

PVPC conducted an equity assessment on the transportation planning tasks completed as part of previous UPWP efforts. UPWP tasks are an important barometer as they aid Towns that might not have the resources to complete the task and because the planning studies and reports generated through UPWP task can result in recommendations that prepare a project for future development. For this assessment process work plans from the previous eleven years were reviewed to identify the transportation planning tasks that were completed for each of the forty-three communities in the PVPC region. These UPWP tasks included data collection, planning studies, local technical assistance requests, and regional activities such as the update to the TIP or CMP. All total, 1,038 tasks have been completed from 2015 – 2022. Planning tasks for 2023 and 2024 are estimated and are likely to increase. While the total number of projects for each community is often a function of the size of the community, at least one task was completed or is expected to be completed for each community over the ten-year period. This information is summarized in Table 4-4.

Table 4-4 - Distribution of UPWP Task by Community by Year

Community	2015	2016	2017	2018	2019	2020	2021	2022	2023*	2024*	Total
Agawam 1	1	3	5	5	3	1	4	8	1	1	32
Amherst 1 2 3	1	1	2	2	10	12	9	8	8		53
Belchertown 1	3	2	2	2	2	2	3				16
Blandford	1				1	1			1	3	7
Brimfield			1	3	1	1	1	2			9
Chester			3	1	1	1	1	1	2		10
Chesterfield		1		1		1				2	5
Chicopee 1 2 3	3	1	2	3	3	12	11	1	8		44
Cumington		1	1	2	1		1				6
East Longmeadow 1	1	1	3	3	4	2	2	2	1	1	20
Easthampton 1 2	1	1	5	4	11	6	6	7	4	5	50
Goshen	1	1	1	2	1						6
Granby			1			2	2		1		6
Granville		1		3	3	1				1	9
Hadley	2	1	2	2	2	4	2	1	1		17
Hampden		1	1	1			1	1			5
Hatfield 1		1			2			1	1		5
Holland	1	2	1	2				1		2	9
Holyoke 1 2 3	3	6	6	4	6	6	9	8	3	5	56
Huntington 1		1		1	1	1	3	1			8
Longmeadow	1	4	2	1	3	4	2	1		1	19
Ludlow 1 2 3		1	2		4	2	2	4			15
Middlefield					2				1		3
Monson 1			1	1	2	3	3	5	3	1	19
Montgomery			1		1					2	4
Northampton 1 2	4	5	6	6	17	10	10	6	6		70
Palmer 1	3	3	2	2	4	2	1				17
Pelham			1		1	3	1	1	1		8
Plainfield				1	1		1			1	4
Region Wide	30	26	24	26	30	28	29	35	32	34	294
Russell	1				3						4
South Hadley 1 2	2	1	4	2	7	10	9	6	6	1	48
Southampton	1	2	1	1	1		1	1		3	11
Southwick	1	2	3	1	4	7	6	2	8		34
Springfield 1 2 3	10	14	11	8	19	18	12	15	11	1	119
Tolland		1	1	2	2	2	2				10
Wales		1	2	2	1			1		2	9
Ware 1	3	2	2	1	3	4	2	1	1		19
West Springfield 1 2 3	1	3	9	2	9	3	4	4	1	5	41
Westfield 1 2 3		2	5	6	6	6	5	8	4	1	43
Westhampton			1		3	1	3	1	1		10
Wilbraham		2	1	4	2			1	1		11
Williamsburg	1	2	1	2	1	7	7	1			22
Worthington		1	1	2	2	1	3		1		11
Grand Total	76	97	117	111	180	164	158	135	108	72	1218

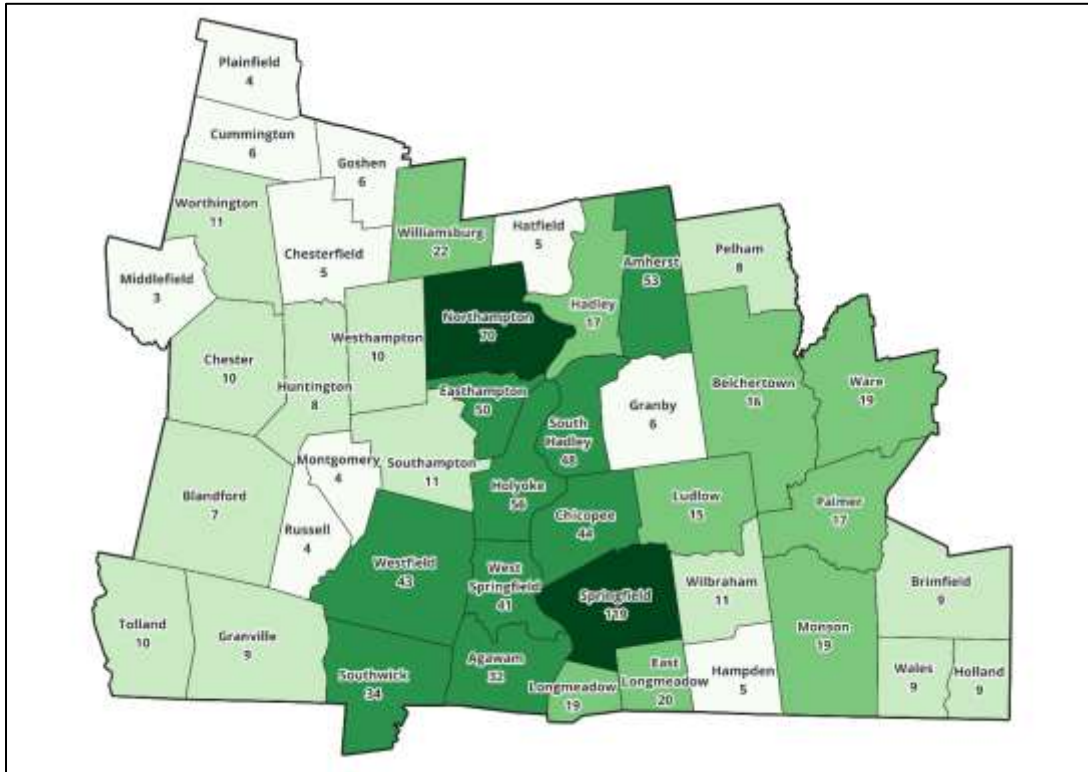
* Estimated

1 Community with Low Income Block Groups

2 Community with Minority Block Groups

3 This community has a higher probability of requiring translation of documents.

Figure 4-9 - Distribution of UPWP Task by Community by Year



4. Pioneer Valley Language Access Plan and Analysis of Language-related U.S. Census Data

The Pioneer Language Access Plan (LAP) describes the MPO’s strategic approach to engage people who are Limited English Proficient (LEP) in transportation planning activities. PVPC’s goal is to ensure that LEP persons have meaningful access to the public involvement process. The LAP Plan clarifies PVMPO’s responsibilities with respect to LEP requirements as a recipient of federal financial assistance from the U.S. Department of Transportation.

The Pioneer Valley Metropolitan Planning Organization (PVMPO) is committed to making the metropolitan transportation planning process accessible to all people who live within the region. The PVMPO programs the transportation projects that utilize federal and state sources of operating assistance for transit, as well as and capital assistance for transportation and transit projects. Support for LEP outreach and related services are integrated with the planning and development of these projects. The PVMPO actively works to identify programs, activities, and services provided by the MPO that are of importance to the public and take reasonable steps to overcome language barriers to these, at no cost to the limited English proficient (LEP) individual. The MPO strives to accomplish the following:

- Translate our most vital documents into Spanish, including our notice of civil rights, compliant procedures, and complaint form. We will make a concerted attempt to translate any documents into other languages upon request.
- Use the MassDOT Engage Tool to identify languages spoken.
- Provide flyers, meeting notices, and other announcements in the languages spoken in the affected area.
- Offer to translate meeting materials, upon request.
- Post notices in non-English community newspapers when appropriate.
- Incorporate Google Translate in our website which may be used to translate site materials into multiple languages.
- Provide interpreters, upon request, at public meetings.
- Translated our transit map into Spanish.
- Provided information about PVRTA service changes in Spanish.
- Provide information about projects that impact a neighborhood or that may have a significant impact in the languages spoken in the area.
- Translate consent forms, and letters containing information regarding participation in a program when needed.

The PVMPO has prioritized the following documents considered vital, and has begun the task of providing translations:

- Notice to Beneficiaries (Notice of Civil Rights)
- Title VI Complaint Procedures
- Complaint Form
- Consent Form
- Statement advising of the availability of free language assistance services for LEP individuals in materials routinely disseminated to the public.
- Notices of proposed public hearings regarding proposed transportation plans and programs.

The PVMPO identifies LEP persons who need language assistance through the following activities and services:

- Coordination with municipal, regional, and state agencies engaged in transportation planning processes.
- Outreach to community-based organizations and municipal agencies to ask for their assistance in identifying LEP persons who may need language assistance.
- Outreach to social service agencies in the region.
- Planning coordination and public involvement services and activities with the Pioneer Valley Transit Authority.
- Inclusion of instructions on how to request language translation of key written documents on public meeting notices.

- Asking persons attending public hearings if Spanish language translation and/or signing interpreter services are desired or needed (services are always available).
- Demographic assessment of census data to ascertain geographic location of potential LEP customers.

The PVMPO maintains a database of a written translation and oral interpreter service provider. This effort improves the speed and convenience with which written documents can be translated for the public and reduces the need to have public requests for them. The staff to the MPO also works to ensure that PVMPO members are aware of the USDOT LEP guidance and support related LEP planning activities.

Analysis of demographic data related to the ability to speak English from the 2017-2021 ACS 5-year Public Use Microdata Sample (PUMS) Data shows the wide range of languages other than English spoken at home in the Pioneer Valley and speaks to the cultural diversity of the region. The largest proportion of people with LEP speak Spanish (65%) followed by Russian and Chinese (either Mandarin or Cantonese) (5%), and Portuguese or Portuguese Creole (4%). The top seven languages account for eighty seven percent of LEP.

Table 4-5 - Languages other than English Spoken at Home in the PVPC Region

First Language Spoken by Person Who Speaks English Less than "Very Well"	Persons	Percent of all People in MPO PUMAs	Percent of all LEP People
Spanish	33,954	5.1%	65%
Russian	2,586	0.4%	5%
Chinese	2,409	0.4%	5%
Portuguese	2,300	0.3%	4%
Polish	1,674	0.3%	3%
Nepali/Marathi/other Indic	1,497	0.2%	3%
Vietnamese	1,023	0.2%	2%
French	748	0.1%	1%
Arabic	654	0.1%	1%
Other Asian	577	0.1%	1%
Khmer	562	0.1%	1%
Amharic/Somali/other Afro-Asiatic	505	0.1%	1%
Ukrainian/other Slavic	491	0.1%	1%
Other Indo-European	486	0.1%	1%
Urdu	406	0.1%	1%
All Others (24 additional languages or categories)	2,735	0.4%	5%
LEP Total in MPO PUMAs	52,607	7.9%	100%

Source: ACS 5-Year 2021 Estimates, Public Use Microdata Sample, "Ability to Speak English" & "Language Other Than English Spoken at Home"

5. Recommendations from the Language Access Plan (LAP) Plan

The PVPC staff will continue to implement recommendations identified through analysis and the public participation process with the assistance of the Joint Transportation Committee, the MPO and the Pioneer Valley Transit Administration. PVPC intends to take the actions necessary to assure that all affected communities are included in the decision-making process and that the information needed to make decisions is available. As the process develops, practices being evaluated today may be institutionalized as policy depending on their success.

Examples include:

- Review and update the measures of effectiveness on a regular basis, incorporating new spending on projects listed in the TIP.
- Continue public participation efforts related to the RTP and to include local presentations at group meetings, neighborhood council meetings, and community activities.
- Continue to follow recommendations related public outreach to LEP populations included in the 2022 PVMPO Public Participation Plan.

6. Ongoing Evaluation of Title VI and EJ Planning Efforts

To assess success in achieving the goals an action item evaluation was developed. This list will be used as an ongoing review of the effectiveness of policies and practices related to EJ and Title VI.

- Has a demographic profile of the metropolitan planning area been developed that identifies low-income and minority populations? Has this data been updated to reflect revised census data?
- Have PVTA and PVPC responded to requests for new and expanded transit service when requested? Has the region sought funds to offer these services?
- Have Title VI reporting requirements been supplemented with a report to the MPO?
- Does the planning process use demographic information to examine the benefits and burdens of the transportation investments included in the plan and TIP?
- Does the planning process have an analytical process in place for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups?
- To what extent has PVPC made initiative-taking efforts to engage and involve representatives of minority and low-income groups through public involvement programs? Does the public involvement process have a strategy for engaging minority and low-income populations in transportation decision making?

- What issues were raised, how are their concerns documented, and how do they reflect on the performance of the planning process?
- What mechanisms are in place to ensure that issues and concerns raised by low-income and minority populations are appropriately considered in the decision-making process?
- What corrective action should be put into the process regarding existing requirements and prepare it for future regulatory requirements?

G. TITLE VI AND EJ SELF CERTIFICATION

The Pioneer Valley MPO has conducted an analysis of the Pioneer Valley Regional Transportation Plan regarding Title VI and EJ conformity. The purpose of the analysis is to evaluate the impacts of the transportation planning process on minority and low-income populations. The analysis evaluates efforts to identify minority and low-income populations, develop public participation inclusive of these populations, and to identify imbalances that impact these populations. The procedures and assumptions used in this analysis follow FHWA guidance, are consistent with the procedures used by MPOs in Massachusetts, and are consistent with Title VI of the 1964 Civil Rights Act, National Environmental Policy Act, Section 109(h) of Title 23, DOT Title VI Regulations, DOT and CEQ NEPA Regulations, Section 1202 of TEA-21, DOT and CEQ NEPA Regulations, Section 1203 of TEA-21, DOT Planning Regulations, Executive Order 12898, USDOT Order 5610.2, and FHWA Order 6640.23.

Accordingly, PVPC has found the Pioneer Valley Regional Transportation Plan to be in conformance with Title VI of the Civil Rights Act of 1964, and requirements of Executive Order 12898 (Environmental Justice). Specifically, the following conditions are met:

1. Conditions Related to Public Involvement

PVPC has identified a strategy for engaging minority and low-income populations in transportation decision making and to reduce participation barriers for these populations. Efforts have been undertaken to improve performance, especially regarding low-income and minority populations and organizations representing low-income and minority populations. The 2022 Public Participation Process was modified to incorporate virtual meetings following guidance from the Massachusetts Office of Diversity and Civil Rights.

2. Conditions Related to Equity Assessment

The Pioneer Valley planning process has an analytical process in place for assessing the regional benefits and burdens of transportation system investments for different socio-economic groups. A data collection process is

used to assess the benefit and impact distributions of the investments and specific strategies are identified for responding to imbalances.

3. Title VI and EJ Conclusions

PVPC addresses Title VI and environmental justice and social equity issues as part of its transportation planning process. PVPC has identified goals to enhance the existing public participation process, to identify low income and minority populations, and provides measures of effectiveness to evaluate transportation deficiencies, benefits, and burdens. The PVPC will continue to improve its public participation and planning process to ensure that it is conducted in accordance with Title VI of the Civil Right Act of 1964, FHWA/FTA guidance on LEP and requirements of Executive order 12898 (Environmental Justice). The MPO will follow all guidance related to the 2021 Justice40 Executive Order (14008) that mandates at least 40% of the benefits of certain federal programs go to disadvantaged communities and equity-focused community outreach.

A photograph of a city street, likely in Springfield, Massachusetts, featuring a red bus driving on a road lined with tall, ornate columns. The background shows a city skyline with various buildings under a clear sky. A green banner at the top left contains the text 'CHAPTER 5'.

CHAPTER 5

5. REGIONAL PROFILE

The Pioneer Valley Region is located in the Midwestern section of Massachusetts. Encompassing the fourth largest metropolitan area in New England, the region consists of 43 cities and towns covering 1,179 square miles. The Pioneer Valley is bisected by the Connecticut River and is bounded on the north by Franklin County, on the south by the State of Connecticut, on the east by Quabbin Reservoir and Worcester County and on the west by Berkshire County.

Unique within the Commonwealth of Massachusetts, the Pioneer Valley region contains a diverse economic base, internationally known educational institutions, and limitless scenic beauty. Prime agricultural land, significant wetlands, and scenic rivers are some of the region's premier natural resources. Its unique combination of natural beauty, cultural amenities, and historical character make the Pioneer Valley region an exceptional environment in which to live and work.

A more comprehensive version of Chapter 5 is presented in the Appendix to the RTP.

A. HIGHWAY

The Pioneer Valley area is considered the crossroads of transportation in Western Massachusetts. Situated at the intersection of the area's major highways, Interstate 90 and Interstate 91, the region offers easy access to all markets in the Eastern United States and Canada. Major southern New England population centers are accessible within hours.



Figure 5-1 – Pioneer Valley Region Map

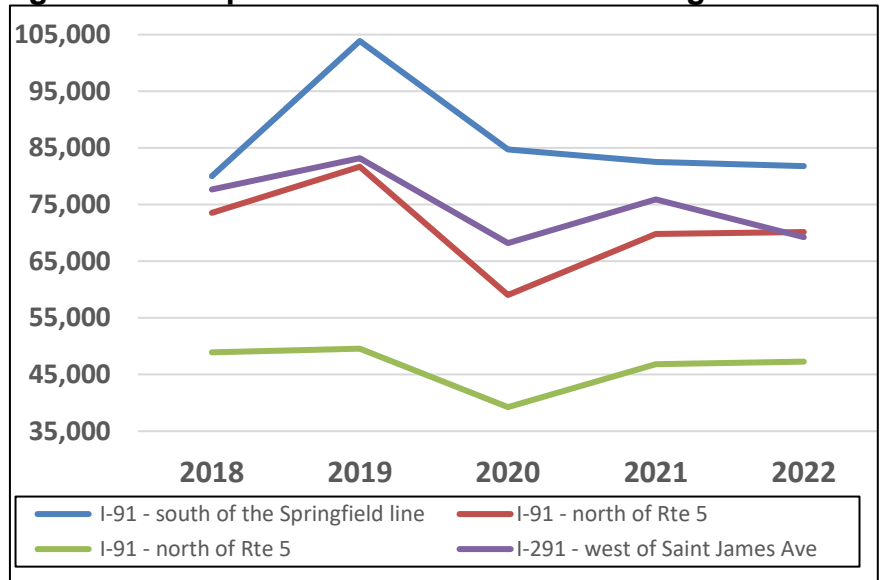
Regional Highway Statistics

- 4,402 Roadway Miles
- 1,500 Federal Aid Eligible Roadway Miles
- 14,171,000 Estimated Daily Vehicle Miles Travelled in 2020.
- 688 Bridges
 - 61 (9%) Structurally Deficient

There are just over 4,402 miles of roadway in the Pioneer Valley region. Roadways are classified based on their design, speed, capacity, and level of access. It is also used to establish funding eligibility. All total, 1,500 miles of regional roads are eligible for federal aid. Local roads, which are not eligible for federal aid comprise approximately 66% of the regional roadway mileage. Cities and towns are responsible for the maintenance of over 82% of regional roadway miles.

The 2020 COVID-19 Pandemic resulted in large decreases in regional daily traffic volumes. Initially, very few people were driving. As people returned to work, many continued to do so from home, resulting in changes to traditional morning and afternoon peak hours. Daily traffic volumes increased in 2021 and in 2022 are closer to pre-pandemic levels.

Figure 5-2 – Impact of Covid Pandemic on Regional Traffic



B. PASSENGER TRANSPORTATION

The Pioneer Valley provides an extensive transit system that offers many different modes of public transportation. Intra-county and Intercity buses, passenger rail service, van service for seniors and disabled riders, ridesharing, and park and ride lots are all vital to the mobility of the regions residents.

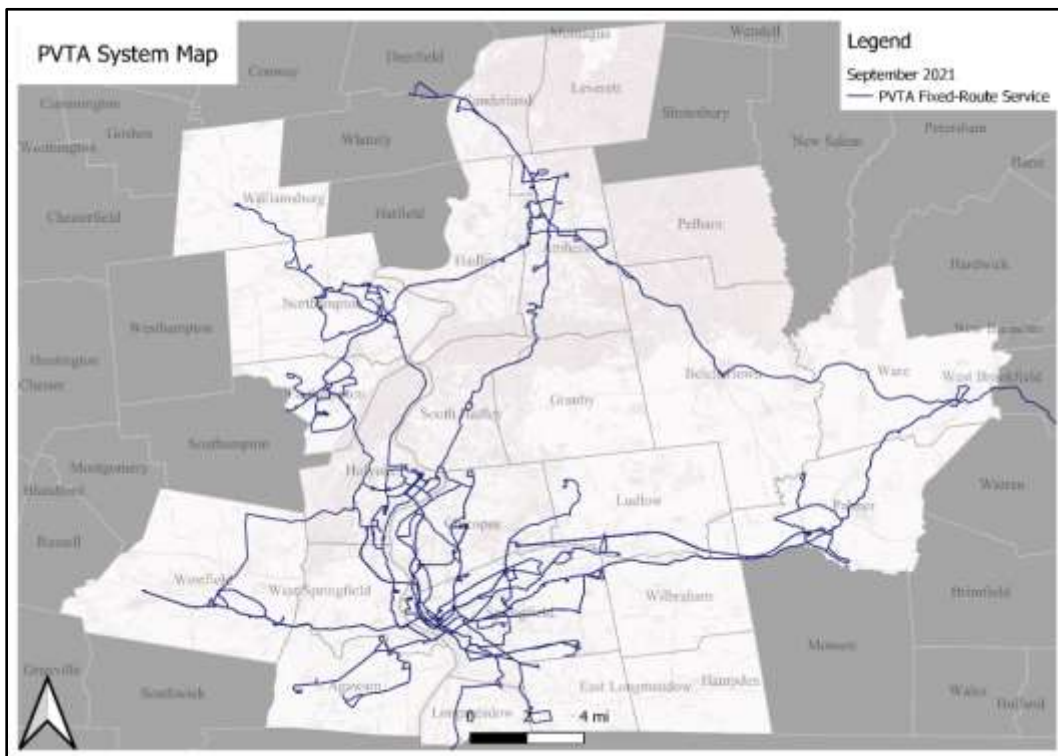
1. Pioneer Valley Transit Authority (PVTA)

- Largest regional transit authority in Massachusetts
- Serves 24 communities.
- 192 vehicle fixed route fleet
 - 15 electric
- 42 fixed bus routes
- 2022 fixed route ridership of 6,077,602
- 128 van paratransit fleet
- 2022 paratransit ridership of 150,074

PVTA’s service area begins at the Connecticut state line and stretches north to Leverett, MA. PVTA serves 24 communities with a total population of 582,800 (2020 U.S. Census). A 2019/22 passenger survey found that 47% of PVTA riders on southern routes and 81% of riders on northern routes use the bus to commute to work or school. A total of 71.5% of riders report earning less than \$20,000 per year and nearly

50% of riders report they do not have a driver’s license or own a vehicle.

Figure 5-3 – PVTA Communities and Bus Routes



a) Paratransit Service

Paratransit is demand response door-to-door van service that is scheduled by the rider. These vans are equipped with wheelchair lifts and other special equipment to insure the safety of disabled riders. In addition to the PVTA, the Franklin Regional Transit Authority (FRTA) provides paratransit service under contract to 14 towns in the region. Councils on Aging (COAs) and Senior Centers in the region also provide transportation to their senior residents. Days, hours of operations, fares and service frequency vary by town. Massachusetts has 4 Regional Coordinating Councils (RCC) formed under Executive Order 530 to enhance the efficiency of community and paratransit transportation services, raise awareness, report unmet needs, and develop regional priorities.

- Services providers:
 - PVTA
 - FRTA
 - COAs/Senior Centers
- 4 Regional Coordinating Councils
 - Pioneer Valley
 - Hilltown
 - Quaboag Valley
 - Central Mass

2. Other Transit Services

The Pioneer Valley is served by a number of other providers such as commercial bus passenger carriers that provide scheduled service to destinations within the region, as well as cities and towns throughout New England and North America. These carriers serve four bus terminals and other stops in the region. The Pioneer Valley also has a number of facilities, organizations and programs to help people share rides. The region has 3 designated and many informal park and ride lots where people may leave their car to board a bus or join a carpool.

Bus Terminals

- Springfield Union Station
- Northampton Bus Terminal
- Holyoke Transportation Center
- Olver Transit Pavilion in Westfield

Commercial Carriers

- Peter Pan Bus Lines
- Greyhound Lines, Inc.
- Charter Tour Service
- Private Van/Taxi Service
- Uber/Lyft



3. Passenger Rail

The Springfield Union Station is currently served by 28 trains daily providing service in the northeastern U.S. and connections nationwide. Passenger rail service is provided on both East-West routes and North-South routes in the region.



North/South Rail Service

- Amtrak and CTRail
- 13 arrivals/13 departures
 - 5 CTRail
 - 7 Amtrak
 - 1 Vermonter
- 28,000 riders in 2017

East/West Rail Service

- Lake Shore Limited
 - Chicago to Boston
- Western Mass Passenger Rail Commission findings on expansion expected in late 2023.

Passenger Rail Terminals

- Springfield Union Station
- Holyoke
- Northampton

Most trains in Springfield operate south to New Haven as either Amtrak or CTRail trains. Amtrak provides daily through service on the Vermonter between St. Albans Vermont and Washington D.C., with major stops at Springfield, Hartford, New York City and Philadelphia. The highest ridership origin-destination pair along the Vermonter route is Northampton, MA to New York City, NY. Valley Flyer service on the Connecticut River Line between Greenfield, MA and New Haven, CT is very successful and MassDOT has committed to permanently operating the route.

A long-distance train, the *Lake Shore Limited* serves Springfield by providing daily service between Chicago and Boston. PVPC has been actively engaged in advocating for additional passenger rail service to Boston. Efforts include a MassDOT initiated study of East/West rail that recommended additional daily trips and more recently the Massachusetts State Legislature's Western Mass Passenger Rail Commission.

C. INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) utilizes technology in traffic control, communications, computer hardware and software to improve the performance of an existing transportation system. The dissemination of real-time travel information improves safety and efficiency while reducing congestion.

The ITS infrastructure is continually expanding in the region. Interstates 90, 91 and 291 have a network of cameras and variable message signs to assist in incident management. PVRTA vehicles are equipped with technology to allow real time tracking of the fleet. The Massachusetts Turnpike converted to all electronic tolling in October of 2018. Massachusetts is a member of the E-ZPass Program, and its transponders are recognized by toll agencies/companies in 19 states.

- I-91/I-90
 - Closed circuit cameras
 - Variable message signs
 - Live travel time information
- PVRTA
 - ITS equipped vehicles
 - Automatic counters
 - Automatic announcements
 - Real-time bus tracker
- Massachusetts 511
- Smart Work Zones
 - Efficient construction areas
- EZDriveMA
 - All electronic tolling

D. NON-MOTORIZED TRANSPORTATION

Bicycle Network

- 90+ mile network across 17 communities.
- ~50 miles of on-road lanes
- 2023 = 24th year of Bike Week
- Bike racks on all fixed route transit vehicles
 - Used 40,706 times in 2022.

Pedestrian Network

- Varies by City and Town.
- More comprehensive in downtown and village centers
- Massachusetts Safe Routes to School Program
 - 79 participating schools

Complete Streets Program

- 28 communities participating
- 18 adopted policies
- 12 funded improvement projects.

Bicycling and walking are inextricably linked to quality of life in our communities. The Pioneer Valley region affords some of the best environments for walking and bicycling in the Commonwealth. An expanding network of off-road trails, vibrant downtowns laced with sidewalks and scenic shared-use roadways create an unmatched potential. As a destination or as a place to call home, the Pioneer Valley offers a wide range of transportation choices.

Currently seventeen communities provide over 90 miles of bicycle lanes, multi-use paths or “rail trails” in the region. Twelve communities provide nearly 50 miles of designated on-road bicycle facilities. Existing and proposed bicycle facilities can be viewed on this interactive [map](#).



The Pioneer Valley Transit Authority supports a popular “Rack and Roll” bikes-on-buses program for the entire region. All fixed route buses are equipped with bicycle racks.

Pedestrian access and circulation are typically better in town or city centers due to the physical design

of such places. Shops, offices, restaurants, and other amenities are generally clustered together and connected by a pedestrian network which is often more accessible and efficient than the vehicle network. Sidewalks are the most common infrastructure feature devoted to pedestrian circulation. The provision of sidewalks in the region varies with respect to location, quality, and function.

The Massachusetts Safe Routes to School program promotes healthy alternatives for children and parents in their travel to and from school. A total of 79 schools in the Pioneer Valley region actively participate in the program. Benefits include education on the value of walking and bicycling and funding for sidewalks, crosswalks, and traffic calming measures.

Valley Bike, a docked bicycle sharing system operated from 2018 - 2022 in Amherst (including UMass), Chicopee, Easthampton, Holyoke, Northampton, South Hadley,

Springfield, and West Springfield.

The fleet consists of electric-assist bicycles deployed at 71 stations. An interactive dashboard of ValleyBike data through 2021 is available [here](#). ValleyBike is currently not in operation (2023) while the communities search for a new vendor.

On average, 383 bicycles were available for use in 2022. The average distance travelled for each ride was 2 miles with most rides lasting 30 minutes or less.

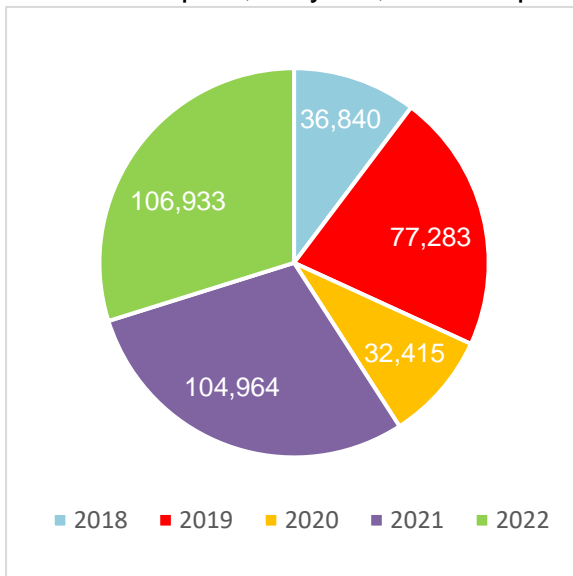
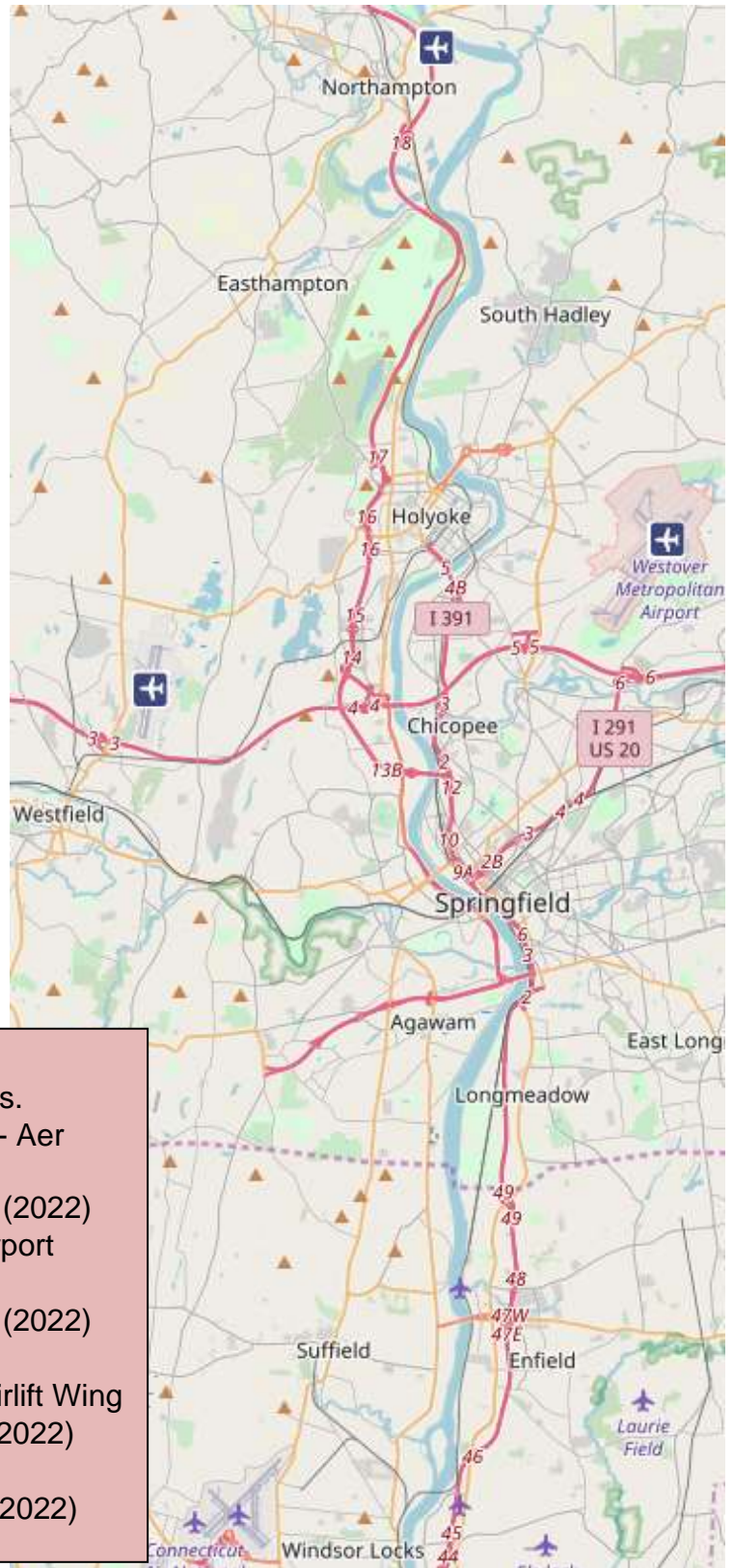


Figure 5-4 – ValleyBike Total Ridership

E. AVIATION

The Pioneer Valley is well served by air transportation facilities located within or adjacent to the region. Most air travel from the region goes through Bradley International Airport in Windsor Locks, Connecticut situated 15 miles south of the City of Springfield. The largest airport the Pioneer Valley region is the Westover Air Reserve Base and Metropolitan Airport facility in Chicopee and Ludlow. The Westfield-Barnes Airport is located in the City of Westfield and is a general aviation facility that also houses the Air National Guard 104th Tactical Fighter Group. Northampton Airport is a small privately owned airport serving both business and recreational uses.



- Bradley International Airport
 - Served by 11 major airlines.
 - Two International carriers - Aer Lingus and Air Canada
 - Averaged 227 daily flights (2022)
- Westfield Barnes Municipal Airport
 - Mass. Air National Guard
 - Averaged 131 daily flights (2022)
- Westover Air Reserve Base
 - Air Force Reserve 439th Airlift Wing
 - Averaged 46 daily flights (2022)
- Northampton Airport
 - Averaged 116 flights/day (2022)

Figure 5-5 – Map of Regional Airports

F. TRANSPORTATION OF GOODS

Trucking

- Dominant mode for freight
- Small, private carriers
- Shortage of truck rest areas

Rail Carriers

- CSX Transportation
 - Yard in West Springfield
- Springfield Terminal Railways
- New England Central
- Pioneer Valley Railroad
- MassCentral Railroad

Air Freight

- No major regional facilities
 - Typically shipped through Logan and Bradley airports

Pipeline

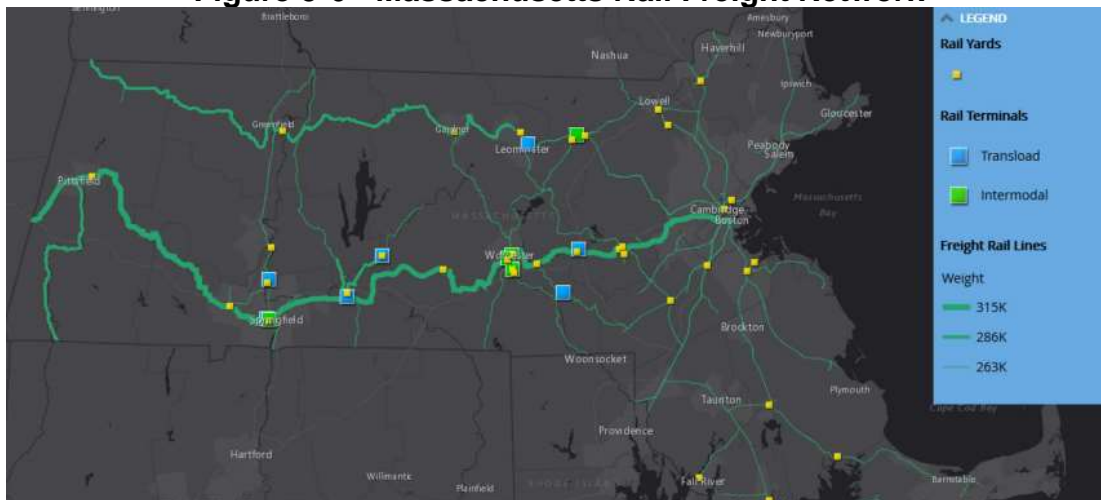
- Natural Gas
- Jet Fuel
- Gasoline and Diesel

Interstates and rail lines in the Pioneer Valley enable the quick delivery of goods to some of the nation's largest cities. The proximity of the region to major and middle-sized cities allows goods from the Pioneer Valley to be quickly transported. Freight is moved in and out of the Pioneer Valley primarily by truck with rail, air and pipeline carrying the remaining goods.



Completed in 2020, the [Pioneer Valley Regional Freight Plan](#) identifies freight needs, reviews existing conditions of the current freight network, and assesses future potential for improvement and expansion of freight in coordination with the [Massachusetts Freight Plan](#). MassDOT has started the process to update this plan.

Figure 5-6 - Massachusetts Rail Freight Network



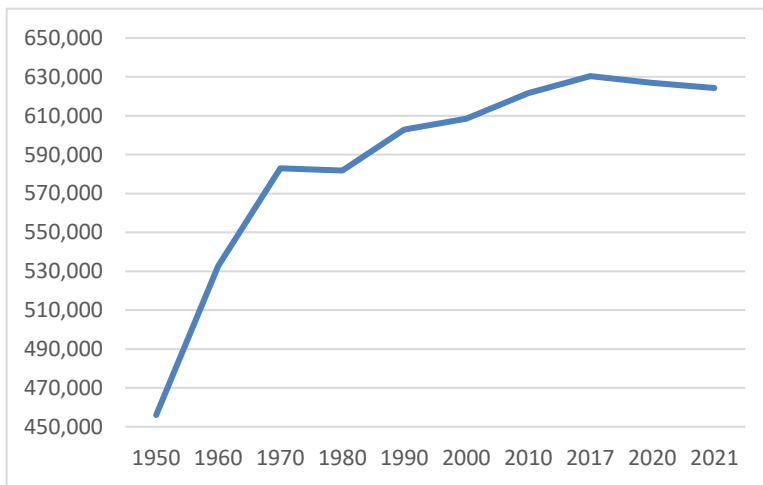
Source: Massachusetts Freight Plan

G. DEMOGRAPHICS

Demographic data was developed for the RTP by the PVPC Data section using the latest information available from sources such as the US Census Bureau, American Community Survey (ACS), U.S. Bureau of Economic Analysis, Massachusetts Department of Revenue, and Massachusetts Department of Employment and Training. For more information, please visit the Pioneer Valley Data Portal at <http://pioneervalleydata.org/>.

- 2020 population = 626,972
 - Up 0.87% from 2010
- 2020 regional households = 240,099
- 2021 total employment = 272,505
- Median household income = \$65,653
- 2015 registered vehicles = 489,999

Figure 5-7 – Population Change 1950 - 2021



Between 2000 and 2010, the region's population grew by 3.6%. Population growth remained steady until 2010 but slowed significantly between 2010 and 2020; only experiencing a net growth of 0.87%. The population of the Pioneer Valley region

grew as a direct result of foreign immigration but has declined slightly since 2017.

Figure 5-8 – 2021 Households by Size

Despite the modest population growth from 2010 to 2020, the number of households present in the Pioneer Valley region still increased by 1.6%. As of 2021, the total household population stands at 244,212. Overall household size is decreasing. Only 20% of all households report a size of four or more. Over 64% of all households are comprised of 1 or 2 occupants.

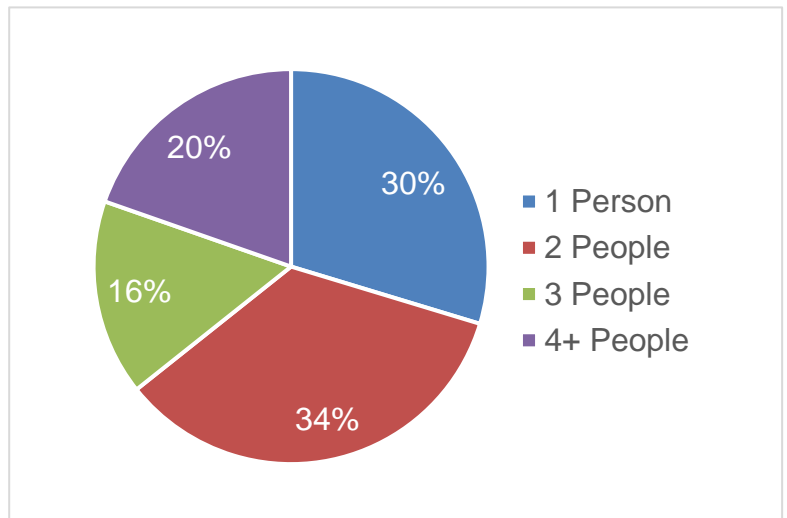
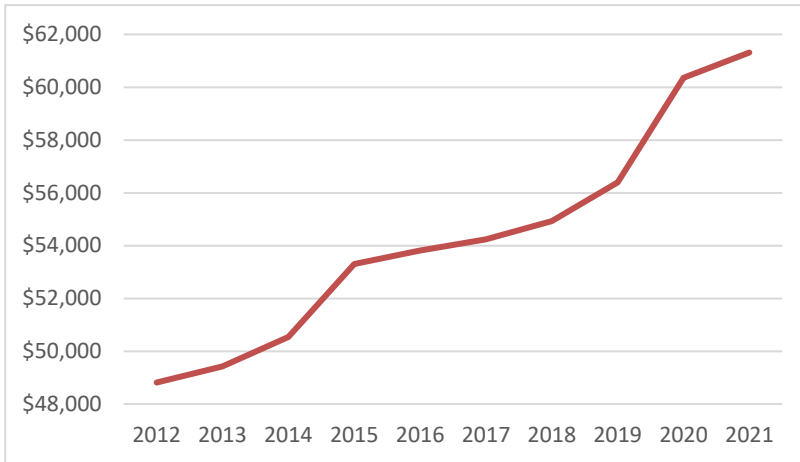


Figure 5-9– Per Capita Income Change 2012 - 2021



Per capita income in the Pioneer Valley region has been increasing steadily. Despite two recessions in the 2000s, per capita wages continue to increase. All total, per capita income has grown by nearly \$5,000 since 2019.

Figure 5-10 – 2015 Vehicle Registration

Based on 2015 data, a total of 489,999 vehicles, or approximately 0.78 vehicles per person were registered in the Pioneer Valley. Between 2000 and 2015, automobile registrations dropped by over 23 percent. Light trucks and SUVs registrations continue to grow and comprise over one-third of registered vehicles. The City of Springfield has the most registered vehicles with 90,493. This translates to 18.5 percent of all registered vehicles.

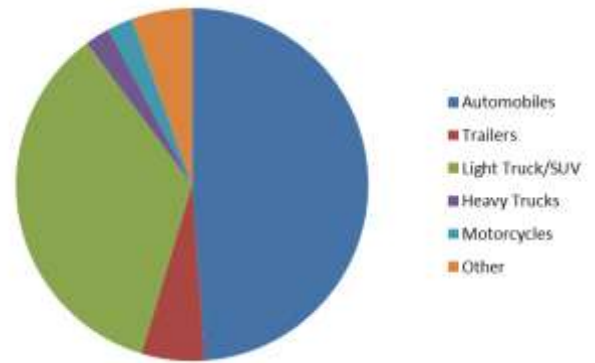
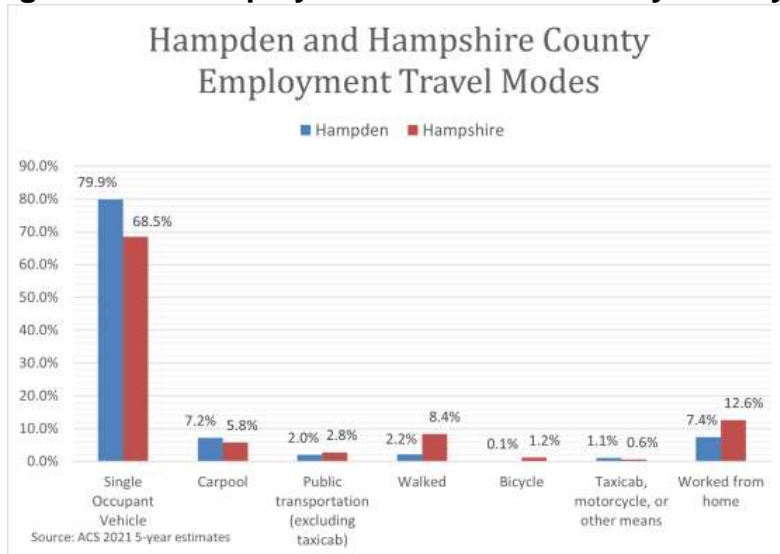


Figure 5-11 – Employment Mode of Travel by County



The mode share differences between Hampden and Hampshire Counties are significant but both skew towards single occupant vehicles. More commuters walk, bicycle or take public transit in Hampshire County, potentially due to the large student population in the Five College area. Work from home almost doubled compared to previous results.



6. SAFETY

The Pioneer Valley Planning Commission collaborates with the communities in the region and works in cooperation with MassDOT to identify and prioritize transportation projects that improve traffic safety in the region. The PVPC provides planning assistance to local communities to select strategies and improvements that improve transportation safety and provides technical support in acquiring appropriate funds to finance the proposed local improvement measures.

A. HIGHWAY SAFETY IMPROVEMENT PROGRAM

The Highway Safety Improvement Program (HSIP) is an important source of funding for transportation safety improvement projects in the region. HSIP is a core Federal-aid program which aims to reduce traffic fatalities and serious injuries on all public roads. The HSIP was established under the SAFETEA-LU legislation and continued under MAP-21 and FAST ACT. The Infrastructure Investment and Jobs Act (IIJA) of 2021 (Public Law 117-58), also known as the “Bipartisan Infrastructure Law” or BIL continued the Highway Safety Improvement Program (HSIP) with several new requirements and increased funding levels. It consists of three main components, the Strategic Highway Safety Plan (SHSP), State HSIP or program of highway

safety improvement projects and the Railway-Highway Crossing Program (RHCP).

To receive HSIP funds, a State must:

- Produce a program of projects or strategies to improve traffic safety.
- Develop, implement, and update a SHSP.
- Evaluate the SHSP on a regular basis.

B. STRATEGIC HIGHWAY SAFETY PLAN

A Strategic Highway Safety Plan (SHSP) is a major component and requirement of the Federal Highway Safety Improvement Program (HSIP). It is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. The SHSP identifies a state's key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries.

MassDOT develops the Massachusetts SHSP in a cooperative process with Federal, State, local, private, and public sector safety stakeholders. PVPC is one of the key contributors in the process of developing the SHSP as well as implementing the objectives in the region. The SHSP is a data-driven, strategic plan that integrates the four E's: engineering, education, enforcement, and emergency medical services (EMS).

The first Massachusetts SHSP was prepared in the year 2006 which was updated in 2013 and a second revision was finalized in December 2018. Most recent update was released in December 2022. The latest SHSP adopts a **Safe System Approach along with emphasis on equity and collaboration**. This method of approaching traffic safety takes a holistic approach which involves participation and guidelines for everyone from those who program, design, construct, maintain and utilize the roads, to those who create, enforce, and adjudicate laws. It is an outline endorsed by U.S. Department of Transportation, and implementing it requires shared responsibility across all agencies and communities. PVPC plays a pivotal role in adapting the revised approach in the region.

Table 6-1 - Projects Advertised under HSIP in Last Decade

FFY	Project Description	Investment
2023	Granby- Improvements at 2 locations on Route 202: School Street and Five Corners	\$1,711,913
2022	No projects funded with HSIP	
2021	Westfield- Improvements & Related work on Route 20, Court Street & Western Avenue, Llyods Hill Road to High Street/Mill Street	\$1,115,769
2020	Chicopee- Reconstruction & Related work on Fuller Road, from Memorial Drive (Route 33) to Shawinigan Drive (2.0 miles)	\$2,008,553
2019	Springfield- Intersection Improvements at Bay Street and Berkshire Avenue	\$1,000,000
2018	No projects funded with HSIP	
2017	Ludlow- Reconstruction of Center Street (Route 21), from 35' west of Beachside Drive westerly to Gas Line beside MTA overpass (3,500 ft)	\$1,080,992
2016	Springfield- Signal & intersection improvements @ Roosevelt Avenue & Island Pond Road, Roosevelt Avenue & Alden Street	\$1,080,992
2015	Hadley- Signal and Intersection Improvements at Route 9 (Russell Street) & Route 47 (Middle Street)	\$1,201,102
2014	Springfield- Signal and Intersection improvements at Sumner Avenue, Allen Street, Abbot Street & Harkness Avenue	\$1,486,364

Source MassDOT

The current SHSP was developed by the Commonwealth of Massachusetts through a multi-step process in which extensive discussions between multi agency stakeholders were organized around 14 emphasis area topics identified from the previous SHSP. These 14 emphasis area groups generated over 400 ideas for input into the new SHSP. These 400 ideas were analyzed and presented back to stakeholders who provided input aligned with **five key Safe System Approach elements: Safe Roads, Safe Speeds, Safe Road Users, Post-Crash Care, and Safe Vehicles**. From these meetings, the ideas were further distilled and prioritized into 6 core initiatives with 31 actions aligned with the Safe System Approach.

The six core initiatives outlined in the SHSP are:

1. Implement speed management to realize safer speeds
2. Address top-risk locations and populations
3. Take an active role to affect change in vehicle design, features, and use
4. Accelerate research and adoption of technology
5. Double down on what works
6. Implement new approaches to Public Education and Awareness

The latest update to the SHSP can be downloaded at:

<https://www.mass.gov/doc/massachusetts-shsp-2023/download>

1. Role of the Pioneer Valley Metropolitan Planning Organization

The Pioneer Valley Metropolitan Planning Organization is responsible for providing support to MassDOT to achieve the SHSP actions and objectives. Regional Planning Agencies (RPAs) and MPOs are identified as responsible agencies for realizing the SHSP's goals and visions.

a) Roadway Safety Audit

A Road Safety Audit (RSA) is a formal safety review of an existing, or planned road or intersection. During the audit, an independent, multidisciplinary team identifies potential safety issues and opportunities for safety improvements.

RSAs have become an important part of the HSIP. An RSA is required for HSIP eligible projects. PVPC participates in all RSAs in the region. PVPC also works in cooperation with MassDOT and local Police departments at some of the locations to help provide the most recent crash data and other relevant traffic volume and congestion data for the RSA team to study and review. Since 2015, 30 RSAs have been conducted in the Pioneer Valley Region. Copies of RSA reports can be obtained from the MassDOT website at: <https://gis.massdot.state.ma.us/roadsafetyaudits/>

Table 6-2 - Roadway Safety Audit Locations by Community

No.	Community	# of Locations
1	Agawam	3
2	Amherst	1
3	Chicopee	6
4	Granby	3
5	Granville	1
6	Hadley	2
7	Holyoke	7
8	Ludlow	1
9	Northampton	5
10	South Hadley	1
11	Southwick	1
12	Springfield	18
13	Ware	1
14	West Springfield	6
15	Westfield	4

Source: MassDOT

C. EXISTING CONDITIONS

The following section provides an update on the existing traffic safety conditions in the region.

1. Massachusetts Crash Data

MassDOT publishes and updates a report which summarizes the top 200 high crash locations in the state. The most recent list is based on reported crashes from 2015 – 2017. The report can be accessed at:

<https://www.mass.gov/doc/2017-top-crash-locations-report/download>

A total of 13 locations from Hampshire and Hampden counties were included in the most recent version of this report. The City of Springfield has 9 of those 13 locations.

2. Regional Crash History

MassDOT maintains a database ([IMPACT](#)) of crashes by collecting the records from the Registry of Motor Vehicles. PVPC utilizes this information as well as crash information collected locally from police departments to analyze and evaluate safety problems at different locations in the region. A summary of the total number of crashes reported by each community to the Massachusetts Registry of Motor Vehicles over the last ten years is provided in Table 6-3. This information consists of crashes that either resulted in a fatality or a personal injury or resulted in greater than \$1000.00 worth of property damage.

The City of Springfield experienced the highest number of crashes (44,341) over the ten-year period while the City of Holyoke experienced the highest number of average annual crashes per roadway mile (9.98). The Pioneer Valley experienced a 2.7% increase in the number of reported crashes between the calendar years of 2021 and 2022.

The PVPC also develops and updates its own list of top 100 crash intersections. The latest report utilized the crash data between the calendar years of 2015 – 2017.

Figure 6-1 - Top 100 High Crash Intersections in the Pioneer Valley

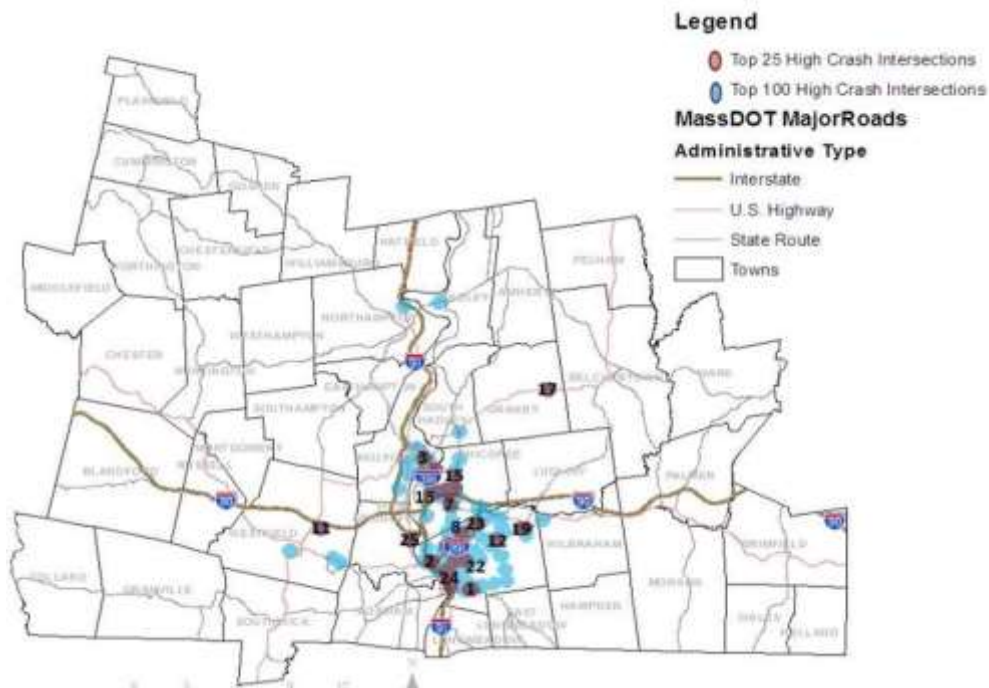


Table 6-3 - Ten Year Community Crash History

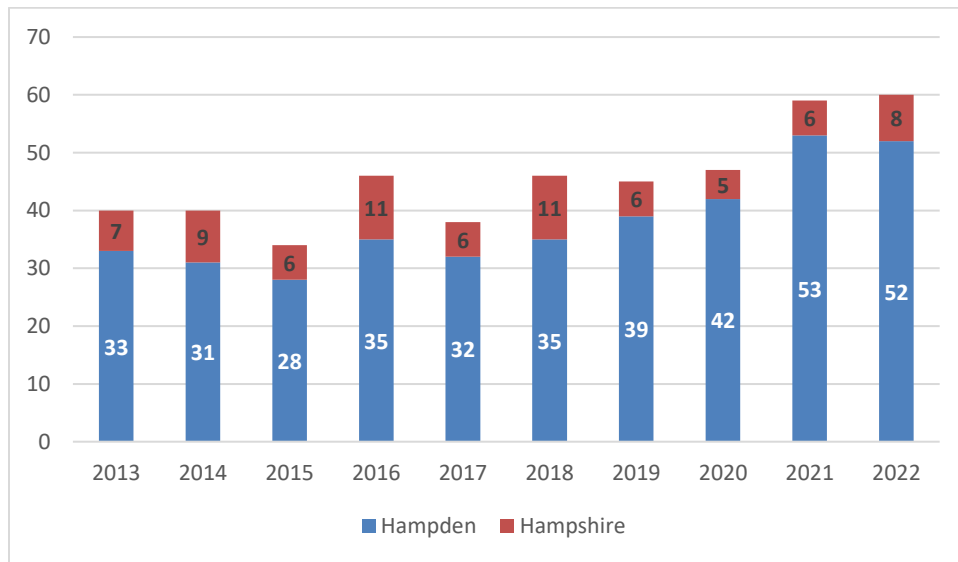
No.	Community	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Crashes	Average Crashes per year	Average Crashes per mile
1	Agawam	480	505	554	589	602	670	798	500	646	664	6008	600.8	3.99
2	Amherst	276	368	430	407	391	458	400	247	299	352	3628	362.8	2.68
3	Belchertown	208	261	254	226	264	247	234	172	210	69	2145	214.5	1.38
4	Blandford	55	67	53	66	78	77	72	60	85	78	691	69.1	0.77
5	Brimfield	55	46	58	114	62	92	54	67	70	83	701	70.1	0.88
6	Chester	15	15	17	13	24	18	18	16	14	16	166	16.6	0.25
7	Chesterfield	17	9	5	17	20	13	11	6	18	14	130	13	0.22
8	Chicopee	1351	1425	1854	1908	1990	1945	2062	1579	1733	1805	17652	1765.2	6.78
9	Cumington	2	4	7	3	2	7	4	5	9	10	53	5.3	0.09
10	East Longmeadow	384	402	391	375	384	345	359	205	261	327	3433	343.3	3.65
11	Easthampton	277	293	282	334	310	290	300	217	234	304	2841	284.1	3.21
12	Goshen	10	18	20	13	19	25	25	16	22	24	192	19.2	0.44
13	Granby	168	154	173	210	183	170	179	128	148	182	1695	169.5	2.51
14	Granville	10	9	10	6	10	7	5	4	6	6	73	7.3	0.10
15	Hadley	267	263	399	461	376	400	414	232	261	323	3396	339.6	4.08
16	Hampden	68	59	57	54	71	50	49	42	58	58	566	56.6	1.05
17	Hatfield	25	23	18	30	55	67	50	35	46	36	385	38.5	0.65
18	Holland	10	9	7	8	3	6	4	7	4	9	67	6.7	0.18
19	Holyoke	1673	1707	1771	1783	1837	1953	1870	1442	1677	1596	17309	1730.9	9.98
20	Huntington	14	12	28	25	32	32	24	20	22	24	233	23.3	0.43
21	Longmeadow	224	187	194	187	403	387	351	216	276	293	2718	271.8	2.76
22	Ludlow	409	395	589	599	657	569	601	424	540	553	5336	533.6	4.12
23	Middlefield	1	5	1	3	3	8	2	3	4	2	32	3.2	0.08
24	Monson	62	61	51	53	33	21	16	24	32	28	381	38.1	0.34
25	Montgomery	11	9	9	12	13	21	21	20	13	13	142	14.2	0.46
26	Northampton	573	577	605	628	650	569	585	374	485	535	5581	558.1	3.09
27	Palmer	409	210	344	379	386	343	258	38	56	92	2515	251.5	2.20
28	Pelham	6	13	6	11	18	30	31	28	12	14	169	16.9	0.37
29	Plainfield	9	4	2	6	3	4	4		5	8	45	4.5	0.09
30	Russell	44	43	53	32	51	37	52	31	47	47	437	43.7	1.21
31	South Hadley	241	246	251	225	236	226	294	103	106	201	2129	212.9	2.05
32	Southampton	51	52	58	73	79	80	59	47	61	76	636	63.6	0.86
33	Southwick	154	144	141	146	163	162	105	73	111	113	1312	131.2	1.72
34	Springfield	4330	4139	4347	4664	4716	4868	4775	3733	4413	4356	44341	4434.1	8.91
35	Tolland	3	3	3	2	2	2	3	1		2	21	2.1	0.05
36	Wales	7	6	8	9	6	13	8	3	12	8	80	8	0.28
37	Ware	188	197	198	234	200	209	236	209	179	153	2003	200.3	1.71
38	West Springfield	727	662	782	630	737	552	1044	774	977	994	7879	787.9	5.50
39	Westfield	735	623	780	786	776	670	769	622	619	677	7057	705.7	2.85
40	Westhampton	15	19	18	19	18	21	20	16	17	11	174	17.4	0.36
41	Wilbraham	304	313	336	349	354	300	302	202	243	281	2984	298.4	2.68
42	Williamsburg	57	41	56	50	42	59	37	43	34	28	447	44.7	0.89
43	Worthington	6	10	12	5	7	12	12	12	14	6	96	9.6	0.15
	Grand Total	13931	13608	15232	15744	16266	16035	16517	11996	14079	14471	147879	14787.9	3.42

Source: MassDOT

3. Fatal Crashes

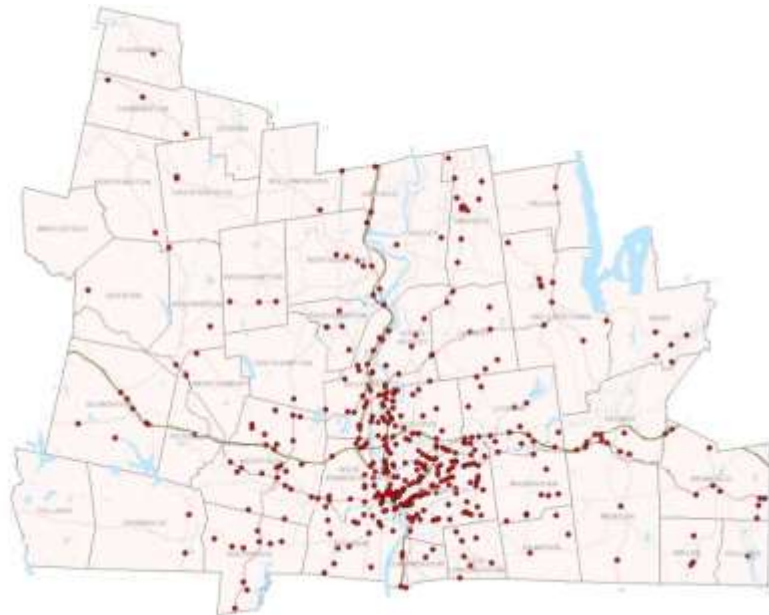
The Pioneer Valley experienced a total of 60 fatal crashes in 2022. Figure 6-3 depicts the fatal crashes in Hampshire and Hampden counties over the past decade. The total number of fatal crashes per year has increased in the region every year for the last four years. This increasing trend is also observed in the state. The new Safe Systems Approach adopted in the SHSP focuses on addressing this concern throughout the Commonwealth and our region.

Figure 6-2 - Fatal Crashes in Hampshire and Hampden Counties



Source: MassDOT

Figure 6-3 - Fatal Crashes in the Region (2013-2022)



4. Bridges

The Commonwealth of Massachusetts maintains a database of more than eleven hundred bridges and culverts that are located in the Pioneer Valley region. The most recent information regarding the construction, type, location, length, and other important features of these structures is included in **Appendix 6-1**. All bridges included in the data undergo routine structural inspection to determine their condition and safety. Results of the most recent inspection were obtained from MassDOT which provides data regarding the condition of a combined total of 688 bridges in our region.

Previously the State utilized a generally accepted rating system developed by the American Association of State Highway and Transportation Officials (AASHTO) to ascertain the condition of the bridges. Beginning in 2018, that system was updated to a new 100-point scale system which measures the Bridge Health Index (BHI).

BHI is a weighted average of the health indices of all bridge elements (e.g., trusses, decks, bridge rails, etc.) to provide a comprehensive overview of the condition of bridges as whole. A value of zero indicates that all the bridge elements are in the worst condition, and a score of 85 or greater indicates that the bridge elements are in good condition.

Under this new system, a 'structurally deficient bridge' is defined as a bridge with a deck, substructure, or superstructure that requires attention. A total of 61 (almost 9%) bridges in the region were found to be structurally deficient. Table 6-4 summarizes the status of bridge conditions within the Pioneer Valley Region by community.

Figure 6-4 - Structurally Deficient Bridges in the Region

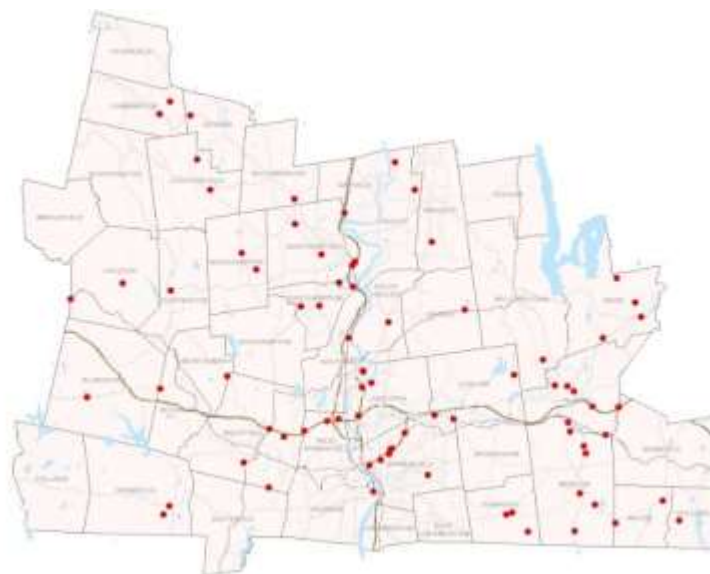


Table 6-4 - Bridge Condition in the PVPC Region

Community	Total No. of Bridges	Average BHI	Jurisdiction				Structurally Deficient	
			Municipal		State		No.	Avg. BHI
			No.	Avg. BHI	No.	Avg. BHI		
Agawam	17	88.78	1	74.74	16	89.66	1	80.61
Amherst	15	84.21	10	82.29	5	88.04		0.00
Belchertown	11	89.11	8	89.57	3	87.90	1	57.95
Blandford	12	85.21	6	89.24	6	81.18		0.00
Brimfield	27	88.91	17	94.29	10	79.77		0.00
Chester	25	88.68	16	87.81	9	90.23	1	72.80
Chesterfield	10	83.27	7	83.64	3	82.40	1	89.98
Chicopee	50	87.36	5	88.11	45	87.27	2	69.96
Cummington	13	82.89	6	81.58	7	84.01	1	78.12
Easthampton	19	82.68	10	79.08	9	86.67	3	59.17
Goshen	4	90.74	2	94.72	2	86.76	1	83.67
Granby	8	85.54	7	84.65	1	91.76		0.00
Granville	7	88.79	4	88.64	3	88.99		0.00
Hadley	10	84.45	4	88.67	6	81.63	1	72.81
Hampden	8	89.87	8	89.87		0.00	1	90.87
Hatfield	15	81.08	5	85.14	10	79.05	1	76.83
Holland	2	70.87	2	70.87		0.00		0.00
Holyoke	49	83.54	9	80.96	40	84.13	2	53.58
Huntington	8	88.89	2	91.21	6	88.12	1	88.47
Longmeadow	4	67.55		0.00	4	67.55		0.00
Ludlow	23	76.86	8	74.71	15	78.00	3	63.76
Middlefield	9	85.65	9	85.65		0.00		0.00
Monson	23	77.95	14	74.58	9	83.19	6	67.67
Montgomery	5	85.67	4	89.02	1	72.29		0.00
Northampton	45	82.14	22	87.01	23	77.48	8	68.23
Palmer	30	80.56	8	78.42	22	81.33	6	66.46
Pelham	3	98.96	3	98.96		0.00		0.00
Plainfield	2	84.85	2	84.85		0.00		0.00
Russell	15	82.78	4	80.85	11	83.48	1	89.10
South Hadley	11	87.16	4	79.57	7	91.50	1	54.32
Southampton	12	88.76	10	86.64	2	99.38		0.00
Southwick	4	92.09	2	85.88	2	98.30		0.00
Springfield	61	83.28	13	86.39	48	82.43	7	65.90
Tolland	1	100.00	1	100.00		0.00		0.00
Wales	1	71.46	1	71.46		0.00	1	71.46
Ware	16	85.16	9	85.01	7	85.35	3	66.80
West Springfield	26	82.18		0.00	26	82.18	3	45.81
Westfield	36	82.42	11	84.33	25	81.58	2	46.21
Westhampton	14	81.49	13	82.05	1	74.12	2	56.96
Whately	1	99.45	1	99.45		0.00		0.00
Wilbraham	4	81.84	2	68.10	2	95.59		0.00
Williamsburg	17	89.14	10	88.72	7	89.75	1	78.98
Worthington	15	88.23	10	85.88	5	92.93		0.00
Total	688	85.13	290	84.94	398	84.97	61	69.86

Source: MassDOT

5. At-grade Railroad Crossings

The Federal Railroad Authority's (FRA) rail crossing inventory summarizes at-grade railroad crossings in the region. There are currently 164 at-grade crossings in the region. **Appendix 6-2** summarizes all the information regarding their location, and other transportation safety amenities provided along these crossings. More than two-thirds of these crossings are located in Hampden County. Many of the crossings are located on non-operational railroad tracks. A total of 37 crossings are gated. While safety gates are not present at most crossings, other supplemental warning devices such as flashing lights, warning signs, and pavement markings are present and require routine maintenance to provide maximum effectiveness. Figure 6-5 depicts the at-grade railroad crossings in the region.

Figure 6-5 - At-grade Railroad Crossings along Active Railroads



6. Dams in the Pioneer Valley Region

There are approximately 260 dams¹ in the PVPC region that are regulated by the Office of Dam Safety. **Appendix 6-3** provides information regarding their location, hazard rating, and other important attributes. To be regulated, these dams are more than 6 feet in height (regardless of storage capacity) and have more than 15-acre feet of storage capacity (regardless of height). There are also many dams in the region that are known as non-jurisdictional dams because they fall below these parameters. Of the regulated dams in the region, approximately:

- 40 have a hazard index rating of high,
- 130 are rated significant hazard, and
- 90 are rated low hazard¹

Hazard index rating is a level of risk determined by the likelihood that a dam failure (an uncontrolled release of impounded water) would result in loss of life or substantial property damage.²

Under dam safety regulations owners have significant responsibilities for their dams. The financial burden associated with these responsibilities can vary greatly, depending on the number of dams for which an owner is responsible, and the dam's condition and hazard index rating.

A dam in poor or unsafe condition can involve very costly repairs, and a hazard index rating also brings with it different requirements related to frequency of inspections by engineers and the need for development of emergency action plans. Both high and significant hazard dams require emergency action plans.

While numerous dams in poor and unsafe condition in the region have been either repaired or removed, there are still:

- 15 significant hazard dams in such condition; and
- 29 low hazard dams in such condition.

It is important to note that many of these 44 dam structures are located upstream of important roadway infrastructure. See Table 6-5 for a listing of specific dams.

¹ These numbers are estimates based on periodic and partial updates to PVPC's dams data base from the Massachusetts Office of Dam Safety.

² Dams that are "likely" to cause such damage are classified as "high hazard"; dams that "may" cause such damage are classified as "significant" hazard; dams that "may cause minimal property damage to others" where "loss of life is not expected" are classified as "low" hazard. Dams that fall into these classifications are regulated by the Office of Dam Safety.

Table 6-5 - Dams in the Pioneer Valley in Poor or Unsafe Condition

Town	Dam Name	Hazard Code Rating	Condition
Agawam	Nine Lot Dam*	Low Hazard	POOR
Agawam	Provost Dam	Low Hazard	POOR
Agawam	Rising Dam	Low Hazard	POOR
Agawam	Robinson Pond Dam	Low Hazard	POOR
Amherst	Factory Hollow Dike	Significant Hazard	POOR
Amherst	Owens Farm Pond Dam	Low Hazard	POOR
Chicopee	Lower Bemis Pond Dam*	Significant Hazard	POOR
East Longmeadow	Wetstone Tobacco Company No. 3 Dam	Low Hazard	POOR
Granby	Forge Pond Dam	Significant Hazard	POOR
Granby	Forge Pond Dike	Significant Hazard	POOR
Granby	Quenneville Dam	Low Hazard	POOR
Hatfield	D.F. Riley Grist Mill Dam	Significant Hazard	UNSAFE
Hatfield	Mountain Street Reservoir Dikes	Low Hazard	POOR
Holyoke	Clear Pond Dam	Low Hazard	POOR
Holyoke	Clear Pond West Dike	Low Hazard	POOR
Longmeadow	Longmeadow Country Club Dam	Significant Hazard	POOR
Ludlow	Gauthier Pond Dam	Low Hazard	POOR
Middlefield	Virginia Lake Shore Dam	Low Hazard	UNSAFE
Monson	Church Manufacturing Co. Dam	Low Hazard	POOR
Monson	Shepard Upper Pond Dam	Low Hazard	POOR
Northampton	Button Shop Dam No. 1	Significant Hazard	POOR
Northampton	Button Shop Dam No. 2	Significant Hazard	POOR
Northampton	Rocky Hill Pond Dam	Low Hazard	POOR
Plainfield	Rod & Gun Club Pond Dam	Low Hazard	POOR
South Hadley	Queensville Pond Dam*	Significant Hazard	POOR
Southampton	Alder Pond Dam	Low Hazard	POOR
Southwick	Dr. Logie Pond Dam	Low Hazard	POOR
Springfield	Breckwood Pond Dam	Significant Hazard	POOR
Springfield	Forest Park Middle Pond Dam	Low Hazard	POOR
Springfield	Porter Lake Dam	Significant Hazard	POOR
Springfield	Putnam's Puddle Dam	Low Hazard	UNSAFE
Springfield	Upper Van Horn Reservoir Dam*	Significant Hazard	POOR
Tolland	Camp Kinderland Dam	Low Hazard	POOR
Tolland	Trout Pond Dam	Low Hazard	UNSAFE
Wales	Norcross Pond No. 2 Dam	Low Hazard	POOR
Wales	Norcross Pond No. 3 Dam	Low Hazard	POOR
Wales	Vinica Pond Dam	Low Hazard	POOR
Ware	Hardwick Pond Dam	Significant Hazard	POOR
Ware	O'Brien Pond Dam	Significant Hazard	POOR
Westfield	Horse Pond Dam	Low Hazard	POOR
Westfield	Stevens Paper Company Lower Dam	Low Hazard	POOR
Westfield	West Parish Filter No. 2 Dam*	Significant Hazard	POOR
Williamsburg	Brass Mill Pond Dam	Low Hazard	POOR
Worthington	Little Galilee Pond Dam	Low Hazard	POOR

Source: Massachusetts Office of Dam Safety, March 2023.

* = Dams where there is known to be current permitting under way for work to address the poor or unsafe condition.

In Table 6-5, Dams labeled as “POOR” are dams with major structural, operational, maintenance and flood routing capability deficiencies. This category also includes unsafe-nonemergency dams. An “UNSAFE” dam indicates a dam whose condition, as determined by the Commissioner, is such that a high risk of failure exists. Among the deficiencies which would result in this determination are: excessive seepage or piping, significant erosion problems, inadequate spillway capacity and/or condition of outlet(s), and serious structural deficiencies, including movement of the structure or major cracking.

With the more frequent larger storm events in the northeastern United States, these and other dams will be tested, and dam failure may increase in likelihood.³ The extreme storm flows produced by Tropical Storm Irene in 2011, for example, led to the failure of at least two dams in the Pioneer Valley Region. An unnamed private dam in Blandford failed, sending a surge of water downstream to inundate and damage nearby roads. At the Granville Reservoir Dam owned by the City of Westfield, the spillway failed when waters overwhelmed and then undermined the structure. The City of Westfield has had to spend \$3 million on repairs and improvements to the dam and spillway.

These storm events raise questions about dams and their current capacity to pass more frequent extreme flows. Poor condition dams in the region—as may have been the case in Blandford—will certainly be tested, but so will other dams—such as the Granville Reservoir Dam, which was reportedly in fair condition at the time of the failure.

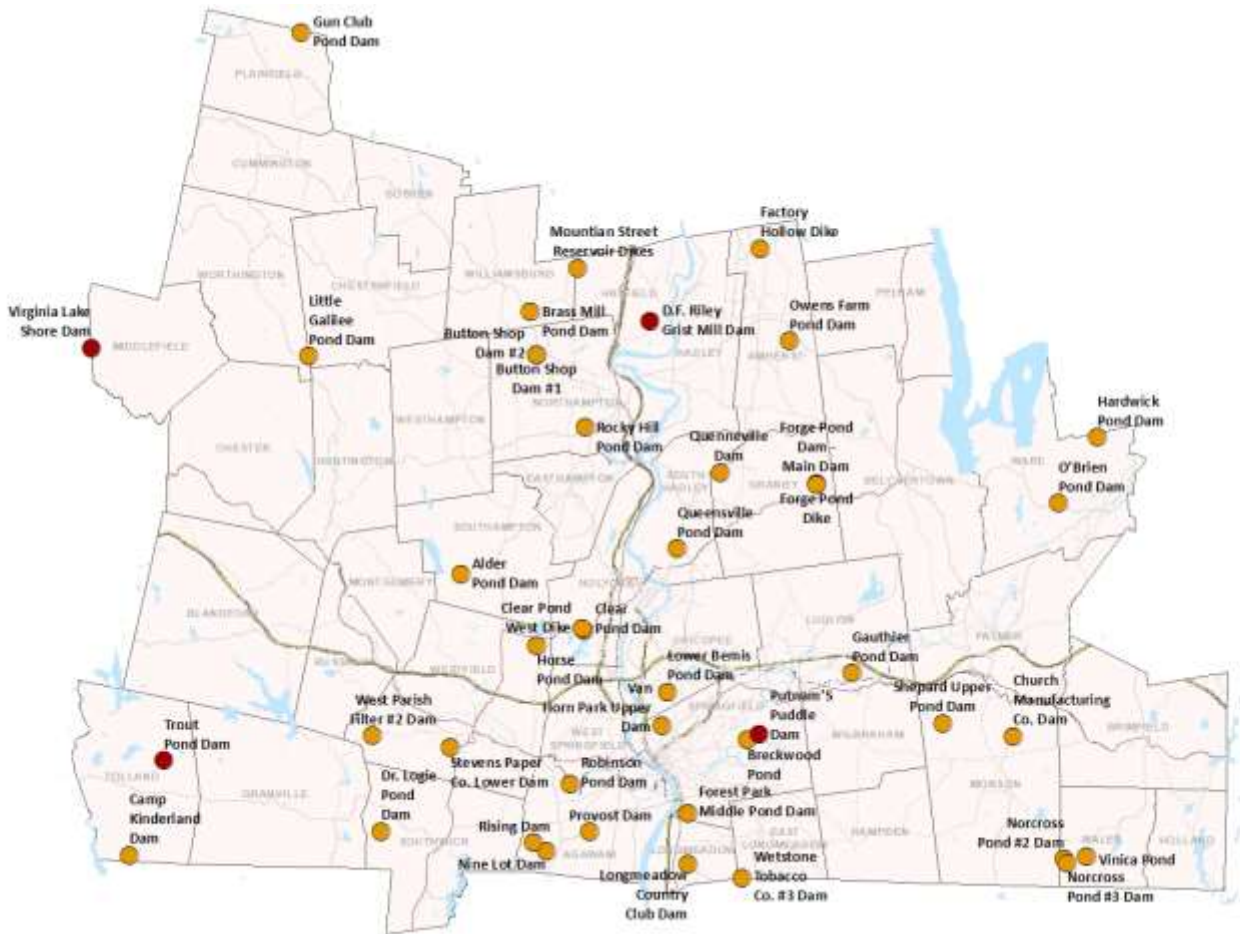
Where a dam is no longer providing a specific beneficial function, such as water supply or power generation, it makes sense to focus resources on removal to avoid what could be the larger costs of damage in the wake of a failure. Throughout the state, there have been 50 dam removals in the past 10 years, with permitting and costs decreasing as professionals, local board, and state agencies continue to gain more experience with design, permitting and construction.

Within the Pioneer Valley, there are several good recent examples of dam removals. These include the 2022 removal of the unsafe significant hazard Lyman Pond Dam in Southampton where the Massachusetts Division of Ecological Restoration worked with the owner to eliminate the threat of failure

³ A study examining climate records, found that New England has experienced the greatest change, with intense rainstorms and snowstorms now happening 85 percent more often than in 1948. This study also found that the biggest rainstorms and snowstorms are getting bigger. Extreme downpours are more frequent and more intense. See: *When it Rains, It Pours: Global Warming and the Increase in Extreme Participation from 1948 to 2011*, Environment America Research & Policy Center, Summer 2012.

on adjacent infrastructure. DER notes that the project also restores connectivity to 27 miles of river habitat on the Manhan River, a cold-water tributary to the Connecticut River. The City of Westfield Water Department removed two dams in recent years: the Winchell Reservoir Dam in 2016 and the Tekoa Reservoir Dam in 2022. Both reservoirs (one located in Granville and the other in Montgomery) had ceased serving water supply purposes decades ago and the costs of maintaining the legacy dam structures for safety became burdensome.

Figure 6-6 - Poor and Unsafe Dams in the Region



D. TRANSPORTATION SAFETY PLANNING PROJECTS IN THE REGION

The PVPC conducts studies at the regional and local scale in cooperation with MassDOT and local communities to improve regional transportation safety. The following summarizes some of the studies performed to assist in the advancement of the SHSP objectives to reduce traffic-related fatalities and serious injuries.

1. Top 100 High Crash Intersections

PVPC develops its own independent listing of high crash locations based on MassDOT data. The first version of this report was completed in 2008. Three updates have since been completed with the most recent one released in 2020 which utilized crash data for the calendar years of 2015, 2016, and 2017.

This report is available at the link pasted below:

<https://www.pvpc.org/content/top-100-high-crash-intersections-pioneer-valley-2015-2017>

2. SafetyCompass

The PVPC developed the SafetyCompass in 2017 to respond to concerns from the JTC and local communities that the Top 100 High Crash Intersections report did not provide safety data outside of the urban core. SafetyCompass summarizes crash data trends for every community in the region. In addition, the SafetyCompass identifies crash data and trends differently for rural and urban communities, recognizing that the total number of crashes is not the sole indication of a safety problem. Each community also received a digital version of the crash data included in the SafetyCompass to incorporate into their local GIS system. An update to the regional SafetyCompass was released in July of 2021.

SafetyCompass can be downloaded from the link pasted below:

https://www.pvpc.org/sites/default/files/SafetyCompass%202015_2017_1.pdf

3. Transportation Safety Studies

As a part of PVPC's Unified Planning Work Program (UPWP), locations in the region that have a history of safety related issues are identified for proposed traffic studies. Crash data obtained from both MassDOT's crash database and local police departments is used in this analysis. PVPC also works with the local community to develop a series of recommendations to improve safety. Past studies have been helpful to advance short term safety improvements and provide documentation to apply for funding to implement long term improvements. The PVPC utilizes information from products such as the Top 100 High Crash Intersections report and SafetyCompass to identify potential locations for safety studies and all studies are coordinated with MassDOT and the JTC.

4. Local Technical Assistance

PVPC helps member communities as part of the Local Technical Assistance (LTA) program to provide short term safety analysis and guidance. This

assistance is performed at the request of the community and typically consists of the review of historic crash data and a brief in-field assessment. PVPC develops a technical memo to summarize the problem and proposes a series of short-term recommendations.

Table 6-6 - Future Transportation Safety Planning Tasks

No.	Products	Completion Date
1	Regional Transportation Safety Interactive Map	September 2024
2	Update Top 100 High Crash Intersections	September 2025
3	Update Safety Compass	September 2026
4	Update Regional Transportation Plan - Safety Section	July 2027
5	Transportation Safety Planning Studies	As Necessary

Source: PVPC

CHAPTER 7

7. SECURITY

The security of the regional transportation system is a constant priority. It is critical to ensure that the highest levels of security are provided for the users of our regional transportation system and that appropriate measures are taken to restrict access to our critical transportation infrastructure.

A. EXISTING CONDITIONS

The region works in collaboration with the Massachusetts Executive Office of Public Safety ([EOPS](#)) and the Massachusetts Emergency Management Agency ([MEMA](#)) to improve the security of the regional transportation system. In cooperation with both agencies changes have been made to increase both existing security measures and public awareness of potential threats to security. The following sections provide additional information on the topic of security for the Pioneer Valley Metropolitan Planning Organization.

1. Homeland Security

The Pioneer Valley Metropolitan Planning organization is part of the Western Massachusetts Homeland Security Region. The Western Region Homeland Security Advisory Council ([WRHSAC](#)) provides planning, financial and technical resources to all 101 communities within Hampden, Hampshire, Franklin, and Berkshire counties of Massachusetts.

The focus of this organization is to support the following activities:

- Support the Department of Homeland Security Nexus to prepare for, respond to and recover from domestic and foreign terrorists' incidents.
- Enhance information and intelligence sharing and communication.
- Address emerging threats.
- Provide multi-discipline, multi-jurisdictional training and exercises.
- Provide regional resources and assets to be utilized in an emergency.

The Pioneer Valley MPO has also assisted in improving Homeland Security by providing planning assistance in the following areas:

- Assisting in the development of Mutual Aid Agreements between the state and local communities.
- Updating maps for critical infrastructure such as bridges and Tier II Haz-Mat locations.
- Providing technical assistance as needed for use in local and regional evacuation planning efforts.

PVPC has conducted evacuation planning studies using the regional transportation model and dynamic traffic assignment. Dynamic Traffic assignment was utilized because it is more responsive to operational factors, route changes, and produces more realistic results for modeling non-traditional conditions. PVPC has conducted analysis of evacuation scenarios involving a hurricane impacting western Massachusetts, an emergency evacuation of the UMass campus in Amherst, a chemical spill closing I-91 at Exit 9, and three flooding scenarios in Springfield.

A number of resources and training videos have been developed by the WRHSAC to assist residents and communities in the area of Homeland Security.

- A [Resource Guide](#) about the resources available to first responders in Western Massachusetts. This also includes an [Interactive Resource Map](#).
- Resource documents to assist emergency management directors and other first responders in developing skills and policies to successfully use social media.
- Regional emergency sheltering plans.
- A separate Western Mass Ready site (<http://www.westernmassready.org/>) to provide resources for individuals to prepare for emergency events.

2. Transit Security

The Pioneer Valley Transit Authority (PVTA) has undertaken extensive efforts to increase the security of the regional transit system. This includes the development of an emergency operations plan for the agency and the placement of security cameras on their entire fleet of buses. PVTA has installed security cameras and audio alert equipment in passenger terminals, vehicle storage and maintenance facilities. Private security firms provide in-person security for all PVTA facilities.

The PVTA participates in regional emergency drills and has provided extensive emergency training for their staff. PVPC has also worked in cooperation with the PVTA to develop videos for emergency responders on how to access PVTA vehicles and provide information on the configuration of the different buses in their fleet. The

PVTA has committed transit vehicles for use in situations that may require the evacuation of residents.

The PVTA Agency Safety Plan (ASP) was developed in 2020 based on guidelines from the FTA Public Transportation Agency Safety Plan (PTASP). The plan discusses possible threats and vulnerabilities to the transit system over a wide array of security threats and assesses their impact on the system. Once assessed, the plan assists in determining how to mitigate the threat and implement corrective measures to eliminate or reduce its severity. The PVTA Safety and Compliance coordinator is responsible for coordinating with local law enforcement and other public safety agencies to manage the response to an incident that occurs on a transit vehicle or affects transit operations.

Federal funding for transit security is available through the FEMA Transit Security Grant Program. This grant provides funding to eligible public transportation systems to protect critical transportation infrastructure and the travelling public from terrorism, and to increase transportation infrastructure resilience. FEMA funding could be a future resource to augment transit security in the region.

3. Rail Security

Similar to rail service itself, rail security is usually defined by both passenger and freight rail services, separated into two parts: passenger rail and freight rail. Unlike air travel, neither passenger or freight rail services lend themselves to the increased security measures utilized at airports. While each type of rail service has its own security concerns, they must not be separated because they often share the same track. Passenger rail stations are often located in densely populated areas, and freight rail transports nearly half of the nation's hazardous waste materials. As a result, the Pioneer Valley Metropolitan Planning Organization has continually integrated both passenger and freight rail security concerns into its regional planning efforts. Representatives from the region's rail providers are invited to participate in monthly Joint Transportation Committee meetings. In addition, all planning studies approved by the MPO include a rail component when appropriate.

a) Pedestrian Rail Access

Trespassing by residents within the rail yard, across railroad bridges and along railroad tracks is not only a safety problem but also is frequently a security problem that involves theft and vandalism. Because of the hazardous materials, dangerous equipment, and unsafe settings found within the rail yard, this unhindered trespass is significant and needs to be addressed. CSX implemented a series of security improvements such as secure access gates, a closed-circuit television system, surveillance patrols, and alarms to their rail yard in West Springfield.

New security fencing was added along the Knowledge Corridor rail line prior to the return of passenger rail service at the end of 2014. A new pedestrian underpass was constructed in 2018 to deter pedestrians from illegally crossing this rail line.

B. WESTERN MASSACHUSETTS EVACUATION PLAN

Completed in January of 2013, the [Western Massachusetts Evacuation Plan](#) provides emergency responders on the local, state, and federal levels with the resources necessary for conducting a regional evacuation in as efficient and effective a manner as possible. The plan provides maps and lists of evacuation routes, population centers, infrastructure, and other critical assets. Contact information for municipal and state officials, as well as major employers, schools, and hospitals is also provided.

This plan pertains to the counties of Berkshire County, Franklin County, Hampshire County, and Hampden County. Contact information for municipalities in Worcester County that border Franklin County, Hampshire County, and Hampden County is also provided, as these towns and cities would potentially be active in any evacuation from western Massachusetts. Information for state resources applicable to the region is also provided. The plan was completed in conjunction with other emergency plans that have been developed for western Massachusetts, including a regional sheltering plan and regional communications plan. Data and recommendations from these plans have been integrated into the evacuation plan to the extent possible.

Evacuation routes were developed based on an analysis of the transportation network, considering factors such as capacity, congestion, and road destinations to develop a hierarchy of primary, secondary, and tertiary routes. Definitions of these routes are as follows:

- Primary – state designated highways that carry the largest capacity and provide the most direct route out of the region.
- Secondary – main arterial roads through towns that carry traffic where primary routes do not exist or provide an alternate route to the primary route.
- Tertiary – local main roads, used to channel traffic towards secondary and primary evacuation routes.

Evacuation routes are shown by county in Figures 7-1 and 7-2.

Figure 7-1 - Evacuation Routes and Water Hazards in Hampden County

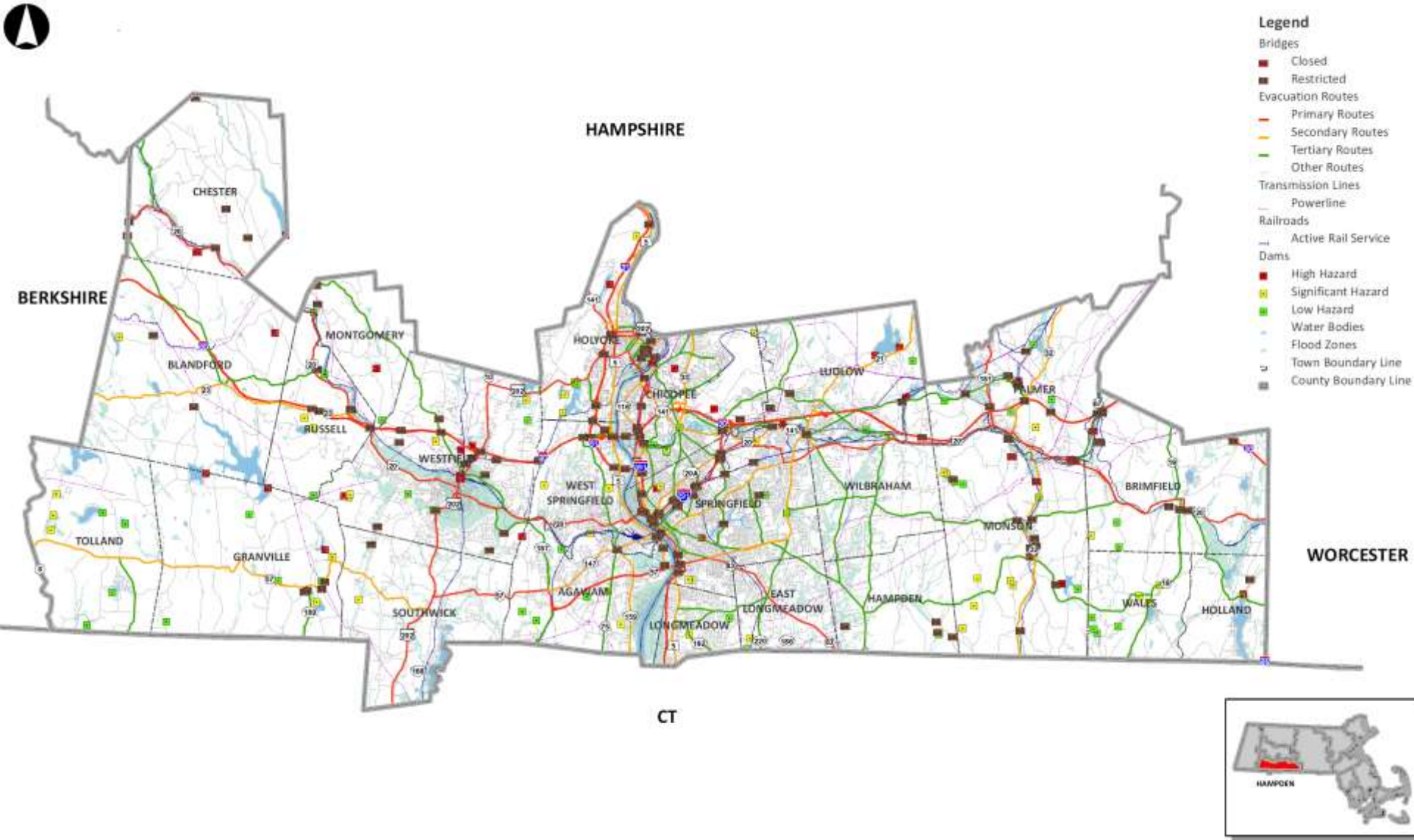
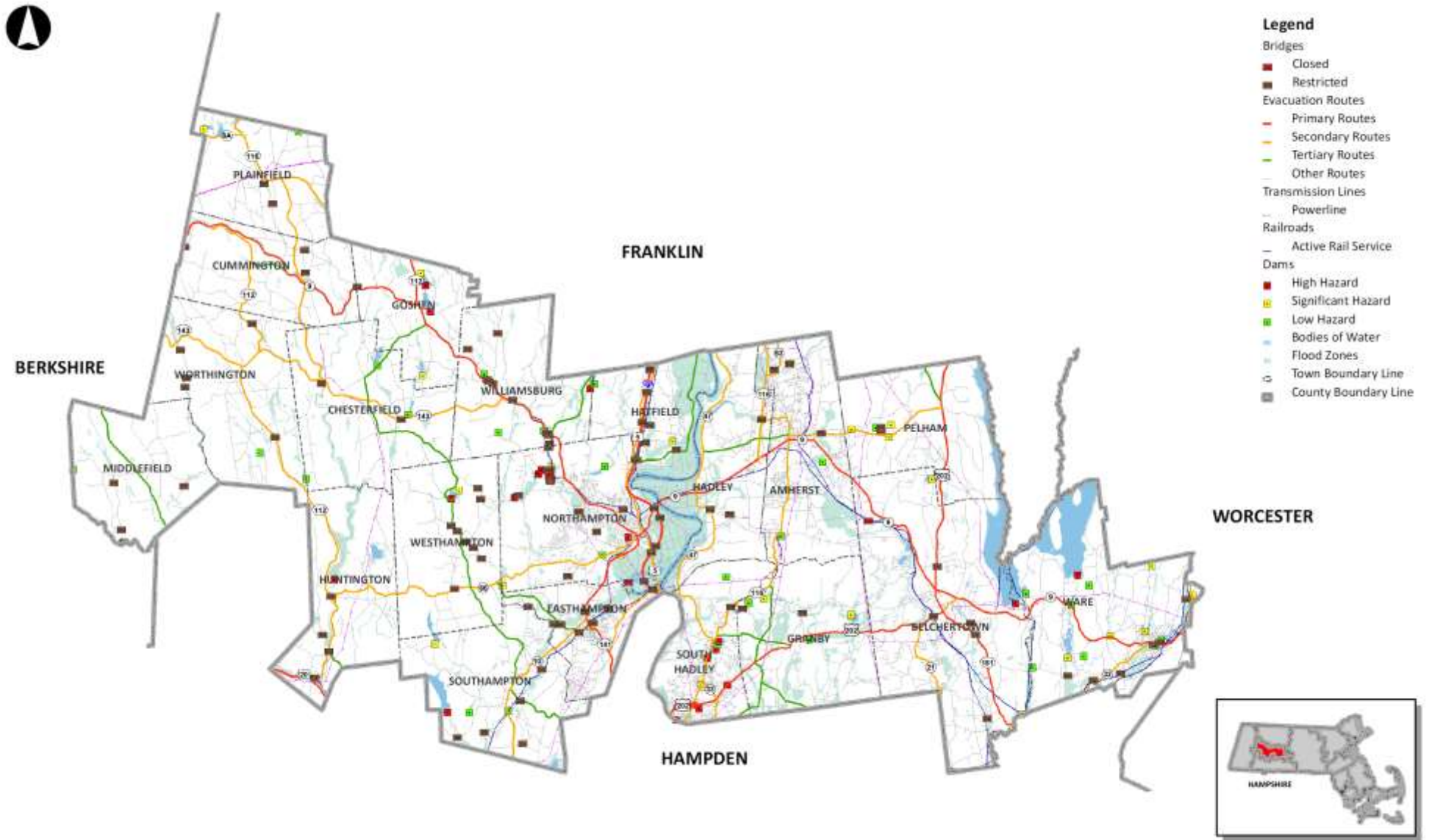


Figure 7-2 - Evacuation Routes and Water Hazards in Hampshire County



C. MASSACHUSETTS COMPREHENSIVE EMERGENCY MANAGEMENT PLAN

The Massachusetts Comprehensive Emergency Management Plan ([CEMP](#)) outlines the system that will be used to prevent, prepare for, respond to, and recover from emergencies and disasters. It also identifies and assigns specific areas of responsibility for coordinating resources to support the Commonwealth's response to an emergency or disaster. Last updated in January of 2019, the CEMP is maintained by MEMA.

1. Massachusetts Emergency Support Function 1 (Transportation) Annex

The Emergency Support Function 1 Transportation Annex ([ESF-1](#)) provides a framework for coordination and cooperation across state agencies regarding transportation needs before, during, and after a disaster, emergency, or planned event. An annex to the CEMP, it describes how the Commonwealth will provide transportation related support and assistance to local jurisdictions in the event local needs exceed available local resources during an emergency.

The primary state agency for the MAESF-1 is MassDOT. As the primary regional transit agency, PVRTA has a supporting role in MAESF-1 including:

- Provide information on the status of PVRTA facilities and operations, including any service restrictions or cancellations.
- Provide buses or other transportation assets as requested to facilitate evacuations or other movements of large numbers of people.
- Provide resources to assist in the movement and/or staging of commodities as needed.

2. Local Hazard Mitigation Planning

PVPC assists its member communities with developing new and updating existing [Hazard Mitigation Plans](#). Hazard mitigation is any action taken to reduce or eliminate the long-term risk to human life and property from hazards. Common mitigation strategies include minor localized flood reduction projects, culvert improvements, wildfire mitigation, and infrastructure retrofits. FEMA requires the plans to be updated every 5 years to maintain eligibility for Hazard Mitigation funding.

The Hazard Mitigation planning process involves an assessment of the risks faced from natural hazards, a review of existing mitigation capabilities currently implemented, identification of action steps that can be taken to prevent damage to property and loss of life, and prioritization of future mitigation efforts to implement. The plans are developed with assistance from

MEMA and funding provided by the Federal Emergency Management Agency (FEMA).

D. IMPROVING REGIONAL SECURITY

A key component of homeland security is the ability to work with federal, regional, local, and private partners to identify the critical infrastructure that is at the greatest risk and take the necessary steps to mitigate these risks. This begins through the identification of our critical links in the transportation infrastructure and the agencies responsible for the maintenance and security of these areas. This is an ongoing process that is defined in the State Homeland Security Strategy (SHSS) for the Commonwealth of Massachusetts. The following goals have been identified as part of the SHSS.

- Engage Stakeholders to Maintain, Enhance, Formalize, and Integrate the Various Components of the Homeland Security System into a Structure that Identifies and Guides Implementation of Homeland Security Strategy.
- Increase the ability to effectively provide prompt and accurate public information and alerts.
- Protect the Commonwealth from Intentional Acts of Violence and Terrorism.
- Enhance Resilience across the Commonwealth by Preparing for & Mitigating Against Acts of Terrorism, and Natural, Technological, & Intentional Hazards.
- Increase Capacity across the Commonwealth to Effectively Respond to Acts of Terrorism, and Natural, Technological, & Intentional Hazards.
- Enhance Capacity across the Commonwealth to Recover from Acts of Terrorism, and Natural, Technological, & Intentional Hazards.

Link to the [Massachusetts State Homeland Security Strategy](#).



8. CONGESTION

A. INTRODUCTION

Understanding the amount of time, it takes to travel through the region at a given time of day is important to ensuring that the system supports the needs of the users. Additionally, knowing that if you use the system at the same time of day the amount of time it takes to travel the same route should be consistent or “reliable” is as important as knowing if s route is congested. The Pioneer Valley Congestion Management Process (CMP) works toward identifying the major traffic congestion locations as well as identifying the reliability of travel through the Pioneer Valley Region. This information is essential in advancing future transportation improvements that will reduce traffic congestion and improve the overall safety and efficiency of our transportation network.

The consequences of inefficient and unpredictable travel are real: aggressive driving, decreased personal safety, and, eventually, stifled community development. The environment also suffers. Stop-and-go traffic needlessly increases greenhouse gas emissions from vehicles and wastes fuel. Congestion also wastes people’s personal and professional time.

The CMP is an integrated planning activity. It supports the Metropolitan Planning Organization (MPO) planning process for regional transportation infrastructure, maintenance, and operating investments. In addition, CMP activities and information are valuable to planning at the municipal level for non-federal transportation investments, as well as for decision-making about land use, environmental protection, housing and community development.

CMP activities are intended to identify existing deficiencies in the regional transportation system through ongoing monitoring and analysis of key performance measures. These performance measures themselves may

evolve as a region's transportation capacities, needs, and shortcomings change.

CMP activities are comprehensive. They involve multiple agencies at all levels of government and stakeholders in communities large and small.

PVPC developed a vision to provide a framework for the development of the CMP.

VISION

The Pioneer Valley Congestion Management Process identifies, evaluates, monitors, and implements transportation strategies that enhance the safety and efficiency of the movement of people, goods, and information.

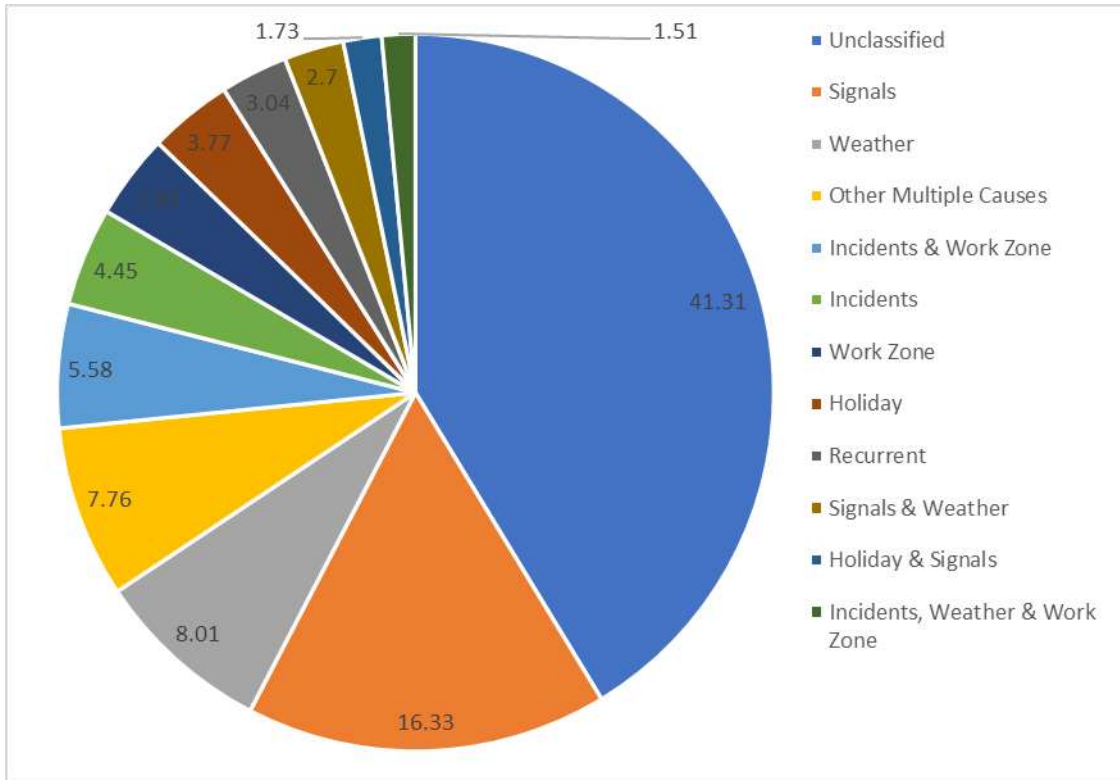
1. Regulatory Context

The current transportation reauthorization bill the Infrastructure Investment and Jobs Act (IIJA) retains the CMP requirement of the Fixing Americas Surface Transportation (FAST – Act) and previous reauthorization laws. The FAST- Act features an eight-step framework for CMP.

- Develop congestion management objectives
- Identify areas of application
- Define system or network of interest
- Develop performance measures
- Institute system performance monitoring plan
- Identify and evaluate strategies
- Implement selected strategies and manage transportation system
- Monitor strategy effectiveness.

CMP activities are a continuation of the predecessor Congestion Management System (CMS) process established by the 1991 federal Intermodal Surface Transportation Efficiency Act (ISTEA). PVPC has continuously engaged in congestion monitoring and analysis consistent with federal guidance in support of the MPO process.

Figure 8-1 - Congestion Causes - 2021



Data Source: RITIS Probe Data Analytics

2. CMP Development Process

The CMP builds on previous versions completed for the Pioneer Valley Metropolitan Planning Organization. Consistent with Federal Highway Administration (FHWA) guidance, the CMP process for the Pioneer Valley has been broadened to better incorporate assessment of the congestion impacts and benefits experienced by transit, cyclists, and pedestrians. This necessitated a significant review and expansion of performance measures. PVPC therefore took this opportunity to engage in a public and agency review of CMP performance measures. Steps included:

- Generate implementation strategies for all transportation modes.
- Engage agency participants and stakeholders in review of the strategies.
- Identify timeframe for availability.
- Data collection and analysis.
- Public review of preliminary findings.

3. Ongoing CMP Implementation Activities

The goal of the CMP is to identify, evaluate, and implement transportation implementation strategies that enhance the safety and efficiency of the

movement of people, goods, and information throughout the Pioneer Valley. In order to achieve this goal PVPC identified the activities necessary to obtain the data needed to fulfill this strategies. Implementation activities included in the CMP are summarized in Table 8-1. The frequency of each activity is based on the availability of existing data and the planning activity the data is used for. Immediate strategy data is not currently available but is anticipated to be available in the near future. Future strategy data is also not available but is highly desirable for use in future CMP activities. As needed activities are performed when requested.

Table 8 1 - CMP Implementation Activities

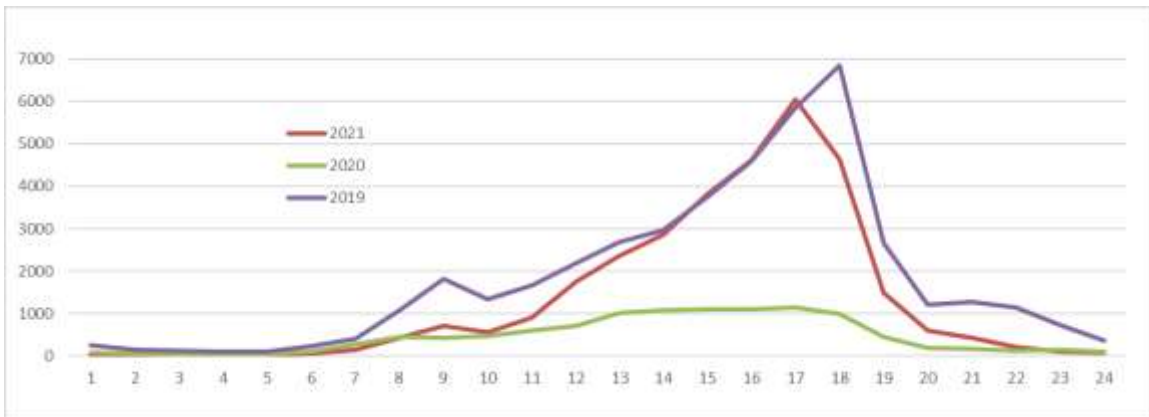
Planning Activities	Frequency
Monitor on-time performance, ridership, and customer satisfaction for regional transit and paratransit services.	Monthly
Continue to calculate Level of Travel Time Reliability (LOTTR) and Travel Time Index (Index) through analysis probe data using NPMRDS and XD datasets currently made available through the RITIS	Every 2 years
Increase awareness and availability of park-and-ride lots in the Pioneer Valley region.	Yearly
Monitor and update the inventory of bicycle lanes and trails in the region.	Every 2 Years
Increase customer satisfaction levels of the bus terminal and shelters.	Monthly
Identify regional auto/transit mode split.	Future
Identify system wide transportation alternatives and monitor, update, and increase intermodal transfer points.	Future
Decrease the number of structurally deficient Bridges.	Yearly
Identify safe alternate heavy vehicle routes in the region.	As Needed
Map travel time contours to show distance traveled in 15-minute intervals.	Every 2 years
Identify off-ramps that are operating at above capacity.	Every 2 Years
Increase efficiency of rail system wide.	Immediate
Improve LOS on major intermodal connector routes to the National Highway System.	Future
Continue to utilize probe data analytics (currently RITIS) to perform congestion analysis	Yearly
Improve access to advance information on ongoing construction activity.	Immediate
Data sharing with regional public and private partners.	Immediate
Provide more advance information for transit riders on anticipated vehicle arrival time.	Monthly
Monitor the average incident response time	Future
Monitor Peak hour loading vs. vehicle rated capacities (load factors).	Monthly
Monitor transit vehicle crash rate and identify high crash locations	Every 2 Years
Monitor PVTA customer satisfaction related to safety throughout the PVTA system.	Monthly
Monitor the EPDO ranking at intersections in the region	Yearly
Monitor the percent of the Federal Aid Eligible Roadway Network rated as Unreliable	Every 2 Years
Identify congestion causes at location identified as congested with a high % of unclassified congestion	yearly
Continue to improve the congestion “ Dashboard ” on the PVMPO website. The purpose of the dashboard is to provide staff and municipalities with congestion data to support ongoing planning activities	Monthly
Update the Top 15 Bottlenecks report – RITIS Data	Every Year
Update the 2019 Study of existing congestion on highway exit ramps and associated back-ups, identify causes	As Needed
Identify locations with a high percentage of unclassified congestion, perform analysis to identify causes	Yearly
Bottleneck Scan - Additional analysis is completed at locations identified as Top Bottlenecks to develop short term strategies to reduce congestion	Yearly

4. Recurring and Non-Recurring Congestion

There are two types of congestion: recurring and non-recurring. Recurring congestion can be expected to occur at the same time every weekday as a result of high volumes of commuter traffic traveling on roadways that are at or near their carrying capacity. Non-recurring congestion occurs because of an unexpected or non-typical event. Some causes of non-recurring congestion include vehicular crashes, vehicle breakdowns, roadway construction, inclement weather, and additional traffic resulting from special events.

Previous versions of the Pioneer Valley CMP only included the impacts of recurring congestion. In the past, travel time data that was thought to have been influenced by unexpected events such as roadway improvement projects or vehicle breakdowns was not used. The CMP now incorporates all regional travel time data regardless of the cause of congestion or its perceived severity.

Figure 8-2 - Person Hours of Delay - 2019 - 2021 (average)



Data Source: RITIS User Delay Cost Analysis

5. Travel Time Data Collection and Analysis

Data collection has evolved with the advancement in technology. Previous versions of the CMP utilized manual data collection using the floating car technique on predetermined corridors. Data collection was restricted to peak hours on non-holidays. For more information on previous data collection strategies please see [chapter 8 of the 2020 RTP](#). For this update, staff utilized the Regional Integrated Transportation Information System ([RITIS](#)). RITIS is an online platform that collects, combines, and analyzes probe data from various sources both public and private. Staff utilized the probe data analytics suite of tools to perform analysis on current as well as archived data on any covered roadway.

Two data sets are available to PVPC through the RITIS platform. National Performance Measure Research Data Set (NPMRDS) was made available to support the analysis and reporting of the PVMPO Performance Measures as required by the Bipartisan Infrastructure Law (BIL). NPMRDS data is available for 1,274 miles of roadway including Interstates and the National Highway System (NHS)

The second dataset available to the PVMPO is the RITIS XD data, XD data was made available to PVPC by MassDOT; as part of [The Eastern Transportation coalition \(TET\)](#). XD data provides additional coverage compared to the NPMRDS data. Currently, there are a total of 7,938 segments covering 2,313 lanes miles of roadway in the Pioneer Valley

6. Methodology

Staff exported RITIS XD data for the entire 2022 calendar year. The data was extracted according to the PM 3 methodology. Raw data was extracted for weekdays: 6am-10am, 10am-4pm, 4pm-8pm, and weekends 6am-8pm. All raw data along with RITIS segment data was then imported into PowerBI Desktop for analysis.

Power BI Desktop is a free application that lets you connect to, transform, and visualize your data. Power BI Desktop allows the user to connect to multiple different sources of data and combine them for analysis. The application lets you build visuals such as graphs that can be exported and used in reports.⁴

The RITIS XD data was uploaded to PowerBI and the PM3 and TTI analysis was performed. The results were verified by staff for accuracy before being exported and sorted. The results are shown below.

B. FEDERAL PERFORMANCE MEASURE - PM3

Originally established as part of the Federal Re-authorization: Moving Ahead for Progress in the 21st Century (MAP-21) and continued in the Fixing Americas Surface Transportation Act (FAST-Act) and the current federal law (BIL), the Federal performance measure established to monitor of system performance (PM3), outlines the process for DOT's and MPO's to access data and the calculations used to identify the Level of Travel Time Reliability (LOTTR). The formula is shown in Figure 8-3.

⁴ <https://docs.microsoft.com/en-us/power-bi/fundamentals/desktop-what-is-desktop>

Figure 8-3 - PM3 Formula

- Level of Travel Time Reliability (LOTTR) – PM3

$$\frac{80\text{th Percentile Travel Time}_i}{50\text{th Percentile Travel Time}_i}$$

6 a.m. – 10 a.m., weekdays
10 a.m. – 4 p.m., weekdays
4 p.m. – 8 p.m., weekdays
6 am. – 8 p.m., weekends

Level of Travel Time Reliability (LOTTR) identifies the consistency of travel time, a roadway can be congested but considered reliable if the time it takes to travel that roadway is the same each day. Staff used the PM3 Formula as well as GIS to identify which roadway segments had one or more time periods rated as unreliable. Additionally, those segments rated unreliable were further classified as severe unreliability (>2.0), serious unreliability (>1.5) or moderate unreliability (=1.5). The severe unreliable locations are listed in Tables 8-2 and 3.

Table 8-2 - Severe Unreliable Locations - 2022

Municipality	Location	Max LOTTR
Agawam	RT-75 S @ Route 57 off ramp	2.00
Amherst	West Street @ Bay Road (Roundabout)	2.40
Amherst	N Pleasant St @ Eastman Ln (roundabout)	2.00
Amherst	Governors Dr @ N Pleasant (roundabout)	2.00
Amherst	N Pleasant St @ Governors Dr (roundabout)	2.00
Amherst	West Street @ W Bay Rd (roundabout)	2.00
Amherst	E Pleasant St @ Triangle st	2.00
Brimfield	Old Sturbridge Road @ Sturbridge Road	2.48
Brimfield	Palmer Rd @ Main Palmer Rd	2.00
Brimfield	Palmer Rd @ Main Palmer Rd	2.00
Chicopee	Burnett Rd @ Pride Truck Park Entrance	2.05
Chicopee	Chicopee St NB @ Yvonne St	2.00
Chicopee	Chicopee St SB @ Yvonne St	2.00
Chicopee	Grattan St @ I-391 Exit 4 on ramp	2.00
Chicopee	I-391 Exit 2 @ Center St	2.00
East Longmeadow	Shaker Rd NB @ Maple St	2.00
East Longmeadow	Center Sq @ Shaker Rd	2.00
East Longmeadow	Center Sq @ Pleasant St	2.00
East Longmeadow	N Main St @ Shaker Rd	2.00
Hadley	Route 9 West @ N. Maple St	2.11
Hatfield	I-91 Exit 30 Left turn Route 5	2.87
Hatfield	Elm street On ramp @ I-91 NB Exit 27	2.33
Hatfield	I-91 NB Exit 27 Left Turn @ Elm street	2.13
Holyoke	South St @ Main St	2.31
Holyoke	Appleton St @ S Canal St	2.00
Longmeadow	Bliss Rd @ Cross St	2.00
Longmeadow	Longmeadow St @ Converse St	2.00
Northampton	N Main Street @ Bridge Road (Roundabout)	2.33
Russell	Route 23 at Route 20	2.62
South Hadley	Pleasant St SB @ Mary Lyon Dr	2.00
South Hadley	Pleasant St NB @ Mary Lyon Dr	2.00
Southwick	Foster Road @ S. Longyard Rd	2.33
Springfield	I-91 S Between Exit 5 and Exit 4	2.76
Springfield	Bicentennial Hwy @ Allen Street	2.67

Table 8-3 - Severe Unreliable Locations – 2022 (continued)

Municipality	Location	Max LOTTR
Springfield	State Street WB @ Homer / Maynard street	2.50
Springfield	S. Shore Dr @ S. Branch Parkway	2.43
Springfield	I-91 S Train Viaduct to Exit 5	2.13
Springfield	State Street EB @ Homer / Maynard street	2.10
Springfield	Plainfield St SB @ Talcott Ave	2.00
Springfield	Plainfield St NB @ Talcott Ave	2.00
Springfield	Plumtree Rd @ Penn Ave	2.00
Springfield	Bradley Rd @ Allen Street	2.00
Springfield	White St @ Belmont Ave	2.00
Springfield	Longhill st @ Edgeland st	2.00
Springfield	Page Blvd @ I-291 NB Exit 5B	2.00
Springfield	Cooley St @ Bicentennial Hwy	2.00
Springfield	Berkshire Ave @ Boston Rd	2.00
West Springfield	River Street @ Park St / S. Blvd	2.20
West Springfield	Amostown Rd @ Dewey St	2.00
West Springfield	S Blvd @ Westfield st	2.00
Westfield	W. Silber St @ Mill St	2.00
Williamsburg	S. Main St @ Main St	2.18

C. TRAVEL TIME INDEX (TTI)

To identify congested segments of roadway, staff utilized the Travel Time Index (TTI). TTI is the ratio of the average peak travel time to a free-flow travel time (see figure 8-4). Index values can be described as an indicator of the length of extra travel time spent during a trip. A travel time index of 1.0 represents free-flow travel conditions in which there are no delays. Any congestion increases the travel time index.

For this analysis Staff used 2019 XD data. Am (7am-9am) and PM (4pm-6pm) Peak hour data was exported for the entire 2019 calendar year and uploaded to PowerBI for analysis. The TTI formula was applied to all segments and sorted from highest TTI to Lowest TTI. The TTI was then broken into Congestion Severity Categories. Severe Congestion > 1.74, Serious Congestion 1.49 – 1.74, Moderate 1.24 – 1.49, and Minimal <1.24.

Figure 8-4 - TTI Formula

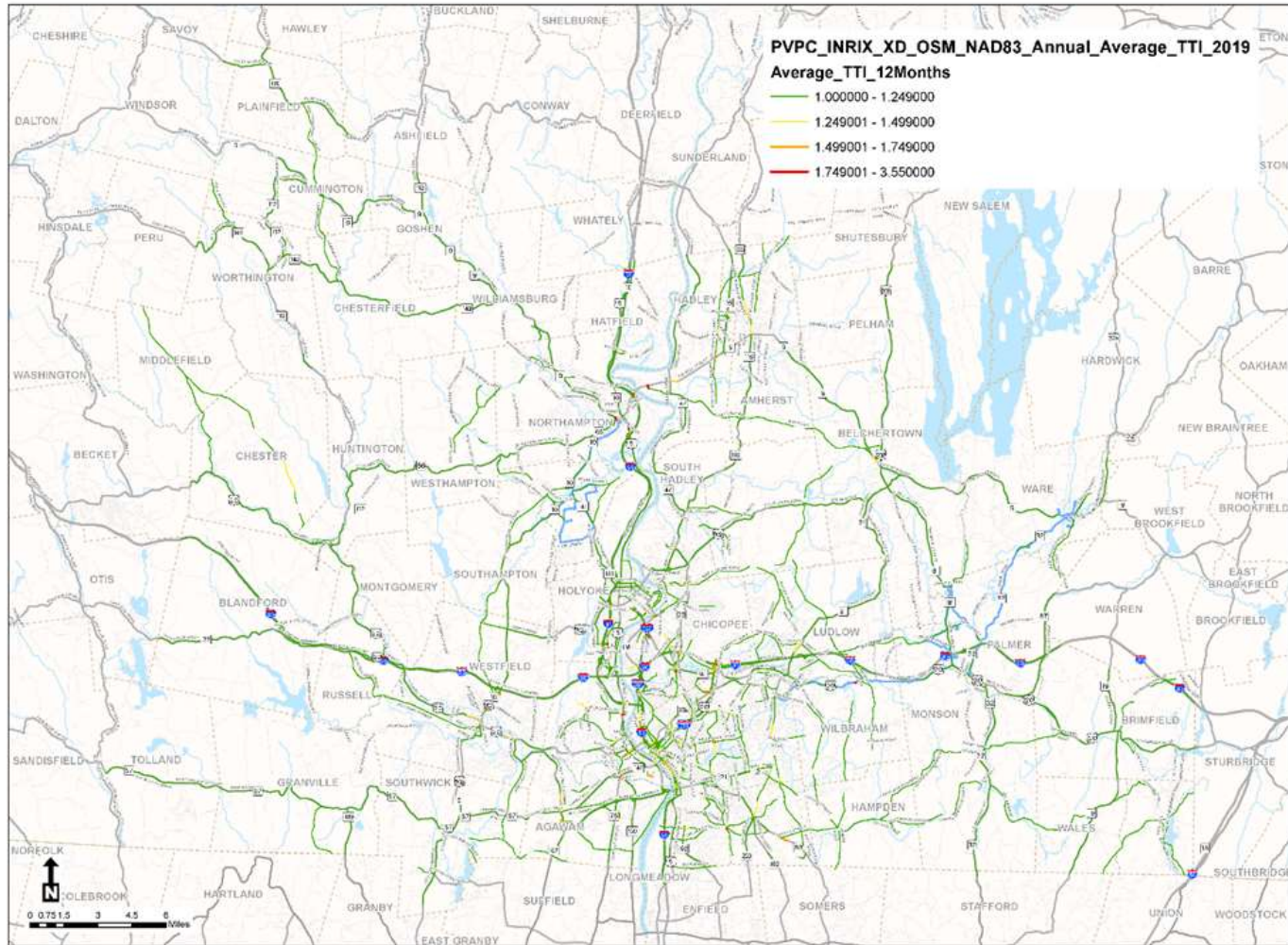
$$TTI = \frac{\textit{Average Travel Time}}{\textit{Free Flow Travel Time}}$$

TTI is used to measure congestion intensity. It is the ratio of time spent in traffic during peak traffic times as compared to light or free flow traffic times. By processing TTI by roadway segment, PVPC will be able to identify regional bottlenecks. See Table 8-3.

For the RTP, PVPC staff has used the same methodology used to determine PM3 reliability by roadway segment to determine TTI. Staff will reevaluate the methodology and modify it to better meet the needs of the CMP.

The list of 2019 congested locations based on the TTI analysis can be found [here](#).

Figure 8-5 - Map of 2019 TTI Results



[Click Here to view Map](#)

D. BOTTLENECK RANKING

The Federal Highway Administration (FHWA) defines a congestion bottleneck as “A localized section of highway that experiences reduced speeds and inherent delays due to a recurring operational influence or a nonrecurring impacting event”⁵. If congestion occurs along an entire corridor, then the corridor is considered congested. Likewise, if the corridor is experiencing congestion only at a specific location, then the corridor is considered a congestion bottleneck.

Staff utilized the RITIS Probe Data Analytics Suite to perform a regionwide congestion scan on all covered roadways for the 2022 calendar year. The congestion scan identifies the top congested segments of roadway based on the criteria selected. RITIS calculates bottleneck based on total delay; the measures are explained below:

Weighted Base Impact — The base impact weighted by speed differential, congestion or total delay - provide additional insight into the effects of bottlenecks on traffic in your area.

Speed Differential — Base impact weighted by the difference between free-flow speed and observed speed. This metric should be used when you want to identify and rank bottlenecks from the individual vehicle perspective.

Congestion — Base impact weighted by the measured speed as a percentage of free-flow speed. Similar to the speed differential metric, the congestion metric should be used when you want to identify and rank bottlenecks from the individual vehicle perspective.

NOTE: The term congestion is defined as "measured speed as a percent of the free-flow speed"

Total Delay — Base impact weighted by the difference between free-flow travel time and observed travel time multiplied by the average daily volume (AADT), adjusted by a day-of-the-week factor. This metric should be used to rank and compare the estimated total delay from all vehicles within the bottleneck.

The Top Bottleneck locations based on the 2022 congestion scan can be found in Table 8-3.

⁵ <http://www.ops.fhwa.dot.gov/bn/lbr.htm#g3>

Table 8-4 - Top Bottlenecks - 2022

Rank	Municipality	Bottleneck Location	Total Delay	Congestion
1	Hadley	MA-9 W @ MA-47/MIDDLE ST	17,673,733	79,895
2	Chicopee	ST JAMES AVE N @ BROADWAY ST	12,925,671	9,130
3	Hadley	MA-9 E @ MA-116	12,784,687	54,972
4	West Springfield / Springfield	US-20 W @ NORTH END BRG	9,664,110	16,650
5	Agawam / Longmeadow	US-5 S @ BLISS RD/EMERSON RD (Southend Bridge)	9,070,992	24,512
6	Amherst	MA-9 W @ MA-116	8,556,180	26,041
7	West Springfield	US-20 N @ US-20/PARK ST	6,808,751	18,718
8	Amherst / Hadley	MA-9 E @ MA-116/S PLEASANT ST	6,517,897	21,153
9	West Springfield	MA-147 W @ RIVER ST	6,468,155	27,841
10	Springfield	WILBRAHAM RD W @ PARKER ST	5,821,610	20,617
11	Springfield	LIBERTY ST N @ MAIN ST	5,666,662	2,782
12	Amherst	MA-116 S @ MA-9/COLLEGE ST/S PLEASANT ST	5,592,091	17,305
13	Westfield	US-202 N @ POCHASSIC ST	4,951,519	10,741
14	Easthampton	MA-10 S @ MA-141/UNION ST	4,868,139	22,335
15	West Springfield	MA-147 E @ UNION ST (memorial Ave)	4,676,814	22,702
16	Agawam / Springfield	US-5 S @ I-91/SOUTH END BRIDGE	4,395,546	11,324
17	Springfield	MAIN ST N @ MONARCH PL/HARRISON AVE	4,380,958	11,877
18	Springfield	COOLEY ST S @ ALLEN ST	4,379,532	11,131
19	Springfield	STATE ST W @ W COLUMBUS AVE	4,362,541	21,486
20	Westfield	US-20 W @ US-202/MA-10/ELM ST	4,129,350	16,502
21	West Springfield	US-5 S @ ELM ST/RIVERDALE ST	4,011,733	11,019
22	Springfield	WILBRAHAM RD E @ PARKER ST	3,981,941	13,688
23	Springfield / West Springfield	US-20 W @ ELM ST (I-291 WB Exit 7B)	3,957,835	9,189
24	Springfield	COOLEY ST N @ ALLEN ST	3,912,010	9,825
25	Springfield	MA-21 S @ US-20/BOSTON RD (Indian Orchard)	3,899,605	8,550
26	Westfield	US-202 S @ US-20/FRANKLIN ST	3,780,447	7,454
27	Longmeadow	US-5 N @ I-91/COLUMBUS AVE (SPRINGFIELD)	3,667,511	7,930
28	Springfield	MA-21 N @ WILBRAHAM RD	3,657,324	11,086
29	Longmeadow /Agawam	US-5 N @ MEADOW ST (Southend Bridge) NB	3,647,748	7,919
30	East Longmeadow	MA-220 N @ SOMERS RD/N MAIN ST	3,497,594	18,006

E. CONGESTION RELATED TRANSPORTATION IMPROVEMENT PROJECTS

As part of the project review process for the [Transportation Improvement Program \(TIP\)](#) projects are scored on various criteria referred to as the [Transportation Evaluation Criteria \(TEC\)](#). The TEC allocates 24 (out of 100) points in multiple criterion related to congestion. Table 8-5 lists those projects anticipated to have a positive impact on congestion based on TEC score and project information.

Table 8-5 - TIP Projects that May Improve Congestion

2024 - 2028	Municipality	SID	Project Name and Description	Cost Estimate	TEC Score	Jurisdiction
2024	SPRINGFIELD	608717	SPRINGFIELD- RECONSTRUCTION OF SUMNER AVENUE AT DICKINSON STREET AND BELMONT AVENUE (THE "X")	\$ 12,966,867	70.5	Municipal
2025	LONGMEADOW / SPRINGFIELD	608881	RESURFACING AND INTERSECTION IMPROVEMENTS ON LONGMEADOW STREET (ROUTE 5) AND CONVERSE STREET (0.84 MILES)	\$ 9,192,421	53.5	Municipal
2025	NORTHAMPTON	609286	NORTHAMPTON- DOWNTOWN COMPLETE STREETS CORRIDOR AND INTERSECTION IMPROVEMENTS ON MAIN STREET (ROUTE 9)	\$ 19,091,946	75.5	Municipal
2026	CHICOPEE	609061	CHICOPEE - INTERSECTION RECONSTRUCTION, MONTGOMERY ROAD AT GRANBY ROAD AND MCKINSTRY AVENUE, AND MONTGOMERY ROAD AT TURNPIKE ACCESS ROAD	\$ 8,848,895	51.5	Municipal
2026	SOUTH HADLEY	608785	SOUTH HADLEY- RECONSTRUCTION OF MAIN STREET FROM THE CHICOPEE CITY LINE TO CANAL STREET (0.67 MILES)	\$ 6,229,080	37.5	Municipal
2027	EASTHAMPTON	612258	EASTHAMPTON- DOWNTOWN COMPLETE STREETS IMPROVEMENTS ON MAIN AND NORTHAMPTON STREETS (ROUTE 10)	\$ 14,716,600	57.5	Municipal
2027 SW	HOLYOKE	611965	HOLYOKE- INTERSECTION IMPROVEMENTS AT BEECH STREET, RESNIC BOULEVARD, AND WEST FRANKLIN STREET	\$ 5,730,400	53.0	MassDOT
2027	WESTFIELD	612600	WESTFIELD- INTERSECTION IMPROVEMENTS AT SOUTHAMPTON ROAD (ROUTE 10/202), SERVISTAR INDUSTRIAL WAY AND BARNES AIRPORT DRIVE	\$ 4,350,000	34.5	MassDOT
	SPRINGFIELD	611964	SPRINGFIELD- INTERSECTION IMPROVEMENTS AT CAREW STREET AND DWIGHT STREET	\$ 7,840,105	NA	MassDOT
Total Cost (9 Projects)				\$ 88,966,314		

1. Travel Time Contours

Travel Time Contours are a great visual tool for showing average travel times from a specific location within the Pioneer Valley Region. These contours were developed for the region based on the location of centers of employment. A total of five employment centers were selected because of their geographic diversity and significance. Each contour is broken down into 15, 30, 45, and 60 minute intervals.

Pioneer Valley Region Travel Time Contours were created using the Esri ArcGIS Online Spatial Analysis Use Proximity Tool Set - Create Drive-Time Areas. Create Drive-Time Areas identifies areas that can be reached within a specified drive time or drive distance. The tool measures out from up to 1,000 roadway points to create drive time buffers. Drive time buffers are calculated using the street location, density, and other physical/use attributes. They take into account one-way streets, stop signs, traffic signals, traffic volume, speed limit, physical barriers, and terrain. The information for both the original contours (circa 2001 and 2015) and the new contours (2023) are shown in the tables below. The latest Pioneer Valley Region Travel Time Contours are shown in Figures 8-6 through 8-10.

Table 8-6 - Travel Time Comparison Northbound Routes (2001, 2015, and 2023)

Northbound	2001 (Minutes)	2015 (Minutes)	2023 (Minutes)
North End Bridge Rotary	2.25	3.86	4.06
I-91 Exit 9 (Route. 20 - North End Bridge)	2.03	4.33	5.06
I-91 Exit 10 (Bernie Ave)	0.65	0.78	0.91
I-91 Exit 12 (I-391 - Chicopee)	1.05	1.09	1.08
I-91 Exit 13A (Route 5 - West Springfield)	0.58	0.79	0.77
I-91 Exit 14 (Massachusetts Turnpike)	2.38	2.54	2.53
I-91 Exit 15 (Holyoke - Ingleside)	0.65	0.90	0.85
I-91 Exit 16 (Holyoke - Route 202)	1.48	1.60	1.56
I-91 Exit 17A (Holyoke - Route 141)	1.17	0.81	0.77
I-91 Exit 18 (Northampton - Route 5)	6.17	7.55	7.23
I-91 Exit 19 (Northampton - Route 9)	1.80	1.91	2.02
I-91 Exit 21 (Hatfield/Northampton)	2.10	2.32	2.36
I-91 Exit 22 (North Hatfield)	2.37	2.61	2.59
I-91 Exit 24 (Deerfield/Whately)	7.12	4.40	4.28
I-91 Exit 26 (Greenfield - Route 2A)	10.47	7.74	7.65
I-91 Exit 27 (Greenfield - Route 2)	2.37	2.58	2.57
I-91 Exit 28 (Bernardston)	4.12	4.67	4.60
Vermont State Line	4.17	4.13	4.19
I-91 VT Exit 1 (US Route 5)	6.93	6.88	7.36
Total	59.85	61.49	62.44

As can be seen in Tables 8-6 – 8-9, with the exception of southbound travel, the average travel times in the region over the past 22 years have not changed significantly. Travel times on average were measured to be approximately 45 seconds slower overall than in 2001 (not including southbound data.) This can be attributed to the fact that infrastructure improvements made in the past have been offset by an increase in vehicular volumes on the roadways. The significant decrease in travel times on roadways in the southbound direction can be attributed partially to less roadway congestion but also to better data. The 2001 data was

manually collected by PVPC staff. The new data as discussed previously is calculated using GIS software and is based on a larger sample size. Westbound times also show a minor decrease in travel times while eastbound and northbound times have increased slightly.

Table 8-7 - Travel Time Comparison Southbound Routes (2001, 2015, and 2023)

Southbound	2001 (Minutes)	2015 (Minutes)	2023 (Minutes)
Memorial Bridge Rotary	5.10	1.86	2.15
I-91 Exit 3 (Route 5/57 - South End Bridge)	2.53	3.01	4.10
I-91 Exit 2 (Long hill Street)	0.37	0.89	0.73
I-91 Exit 1 (Route 5 - Longmeadow)	0.63	0.12	0.12
I-91 CT Exit 49 (US Route 5)		3.77	3.77
I-91 CT Exit 48 (CT Route 220)	1.27	1.53	1.54
I-91 CT Exit 47 (CT Route 190)	2.08	0.41	0.41
I-91 CT Exit 46 (US Route 5)	2.30	2.57	2.59
I-91 CT Exit 45 (Bradley Airport)	8.22	2.16	2.12
Total	22.50	14.46	17.53

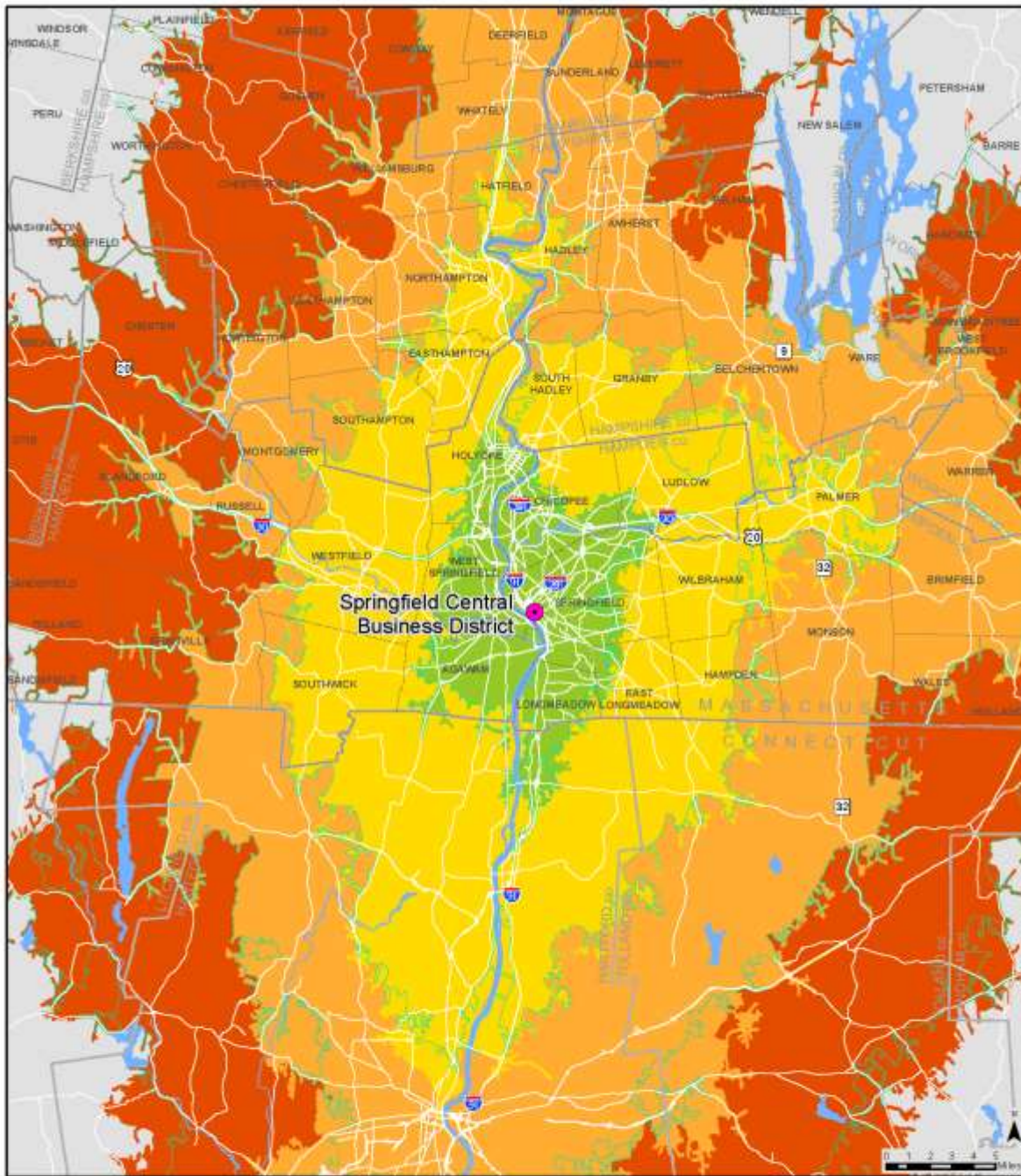
Table 8-8 - Travel Time Comparison Eastbound Routes (2001, 2015, and 2023)

Eastbound	2001 (Minutes)	2015 (Minutes)	2023 (Minutes)
I-291 Exit 2 (Dwight/Chestnut Streets)	4.67	5.51	6.65
I-291 Exit 3 (Armory Street)	0.73	0.68	0.73
I-291 Exit 4 (St. James Avenue)	1.07	1.37	1.34
I-291 Exit 5 (Page Boulevard)	1.72	1.76	1.77
I-291 Exit 6 (Shawinigan Drive)	1.38	1.26	1.28
I-90 Exit 6 (Chicopee/Springfield)	2.03	2.01	1.94
I-90 Exit 7 (Ludlow)	4.27	3.20	3.45
I-90 Exit 8 (Palmer)	5.88	7.02	7.00
I-90 Exit 9 (Sturbridge)	14.12	14.71	14.43
I-90 Exit 10 (Auburn/Worcester)	10.67	10.87	10.73
Total	46.53	48.39	49.32

Table 8-9 - Travel Time Comparison Westbound Routes (2001, 2015, and 2023)

Westbound	2001 (Minutes)	2015 (Minutes)	2023 (Minutes)
I-90 Exit 4 (Holyoke/West Springfield)	12.78	10.73	10.36
I-90 Exit 3 (Westfield)	5.45	4.43	4.99
I-90 Exit 2 (Lee)	27.23	28.12	27.69
I-90 Exit 1 (West Stockbridge)	7.63	8.14	7.91
Total	53.10	51.42	50.95

Figure 8-6 - Travel Time Contours for the Springfield Central Business District



Central Business District Drive Times

(Calculated May 2023, using average traffic conditions for Wednesdays 8am)

SPRINGFIELD, MA

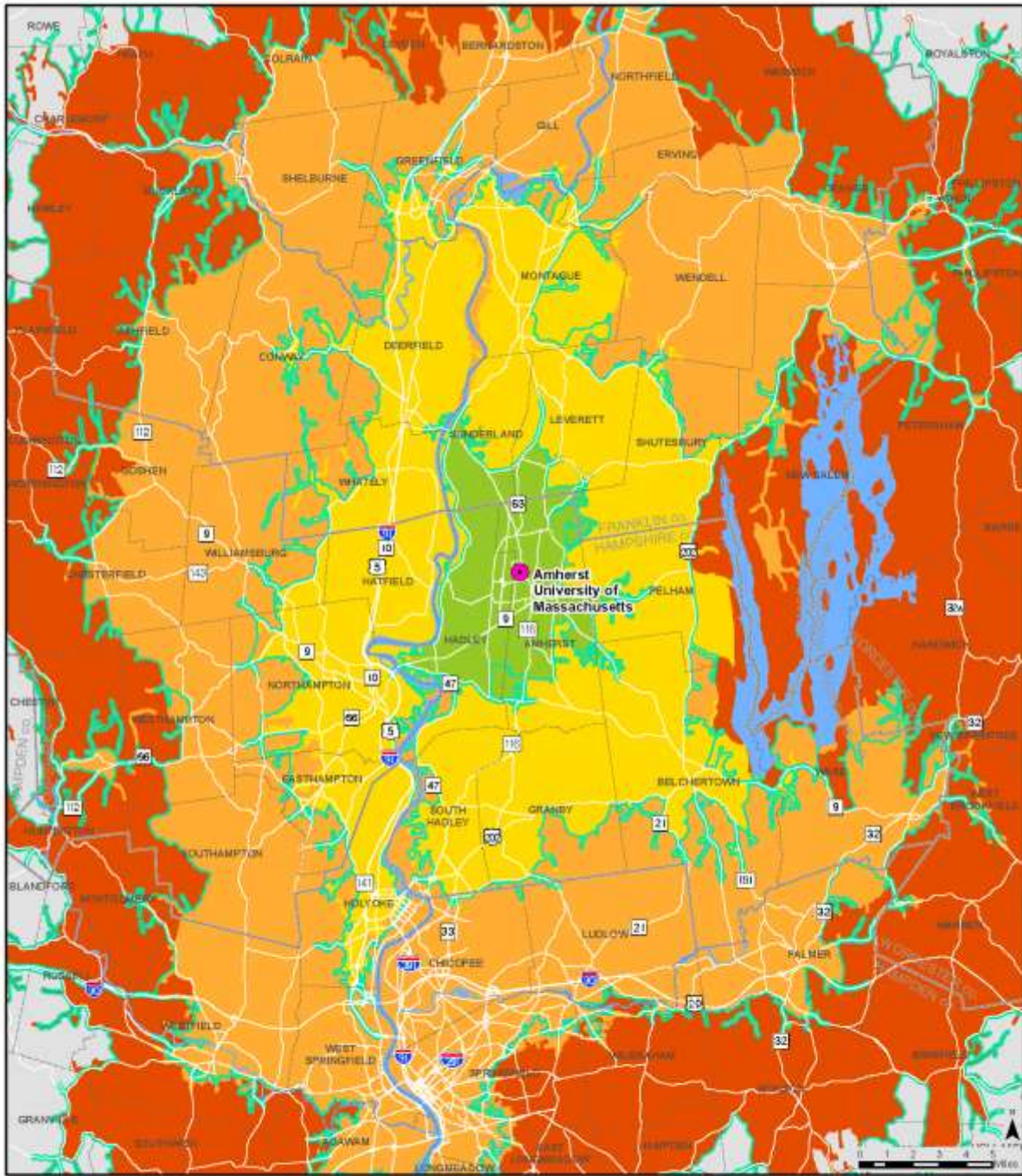
Drive Time Areas

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

December 2018

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

Figure 8-7 - Travel Time Contours for the University of Massachusetts - Amherst



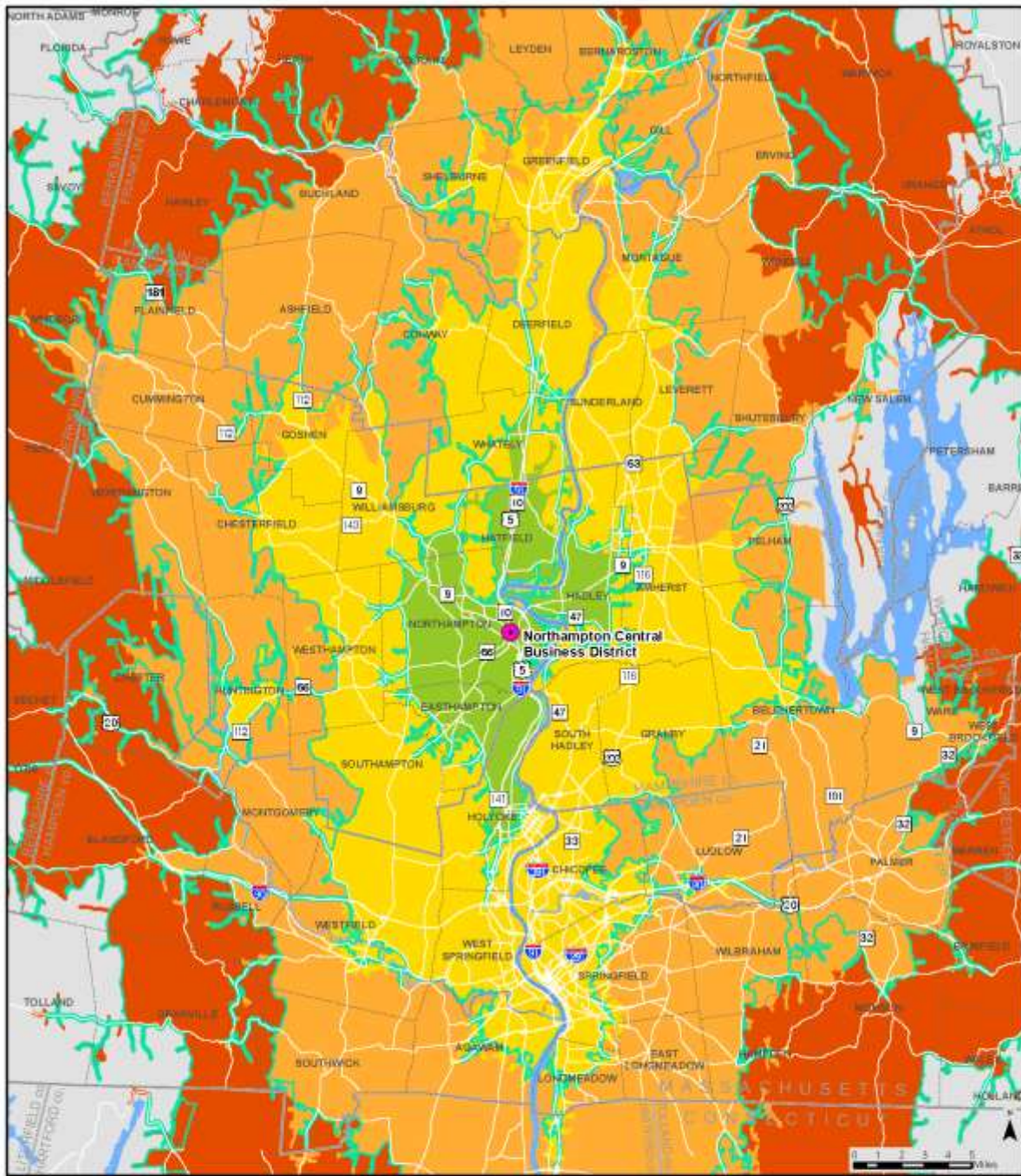
Central Business District Drive Times

(Calculated May 2023, using average traffic conditions for Wednesdays 8am)

AMHERST, MA



Figure 8-8 - Travel Time Contours for the Northampton Central Business District



Central Business District Drive Times

(Calculated May 2023, using average traffic conditions for Wednesdays 8am)

NORTHAMPTON, MA

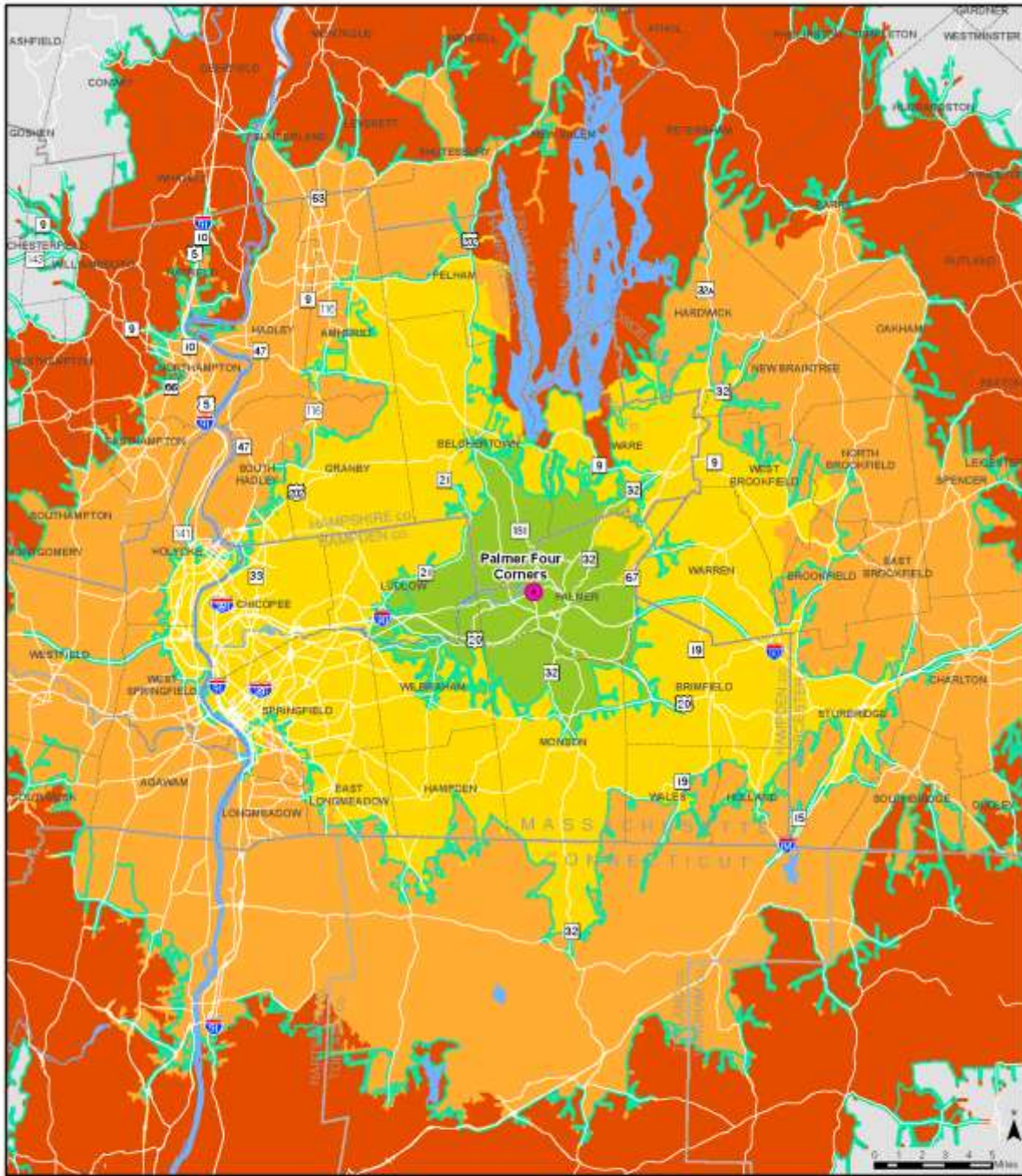
Drive Time Areas

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

December 2018

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

Figure 8-9 - Travel Time Contours for the Palmer Four Corners



Central Business District Drive Times

(Calculated May 2023, using average traffic conditions for Wednesdays 8am)

PALMER, MA

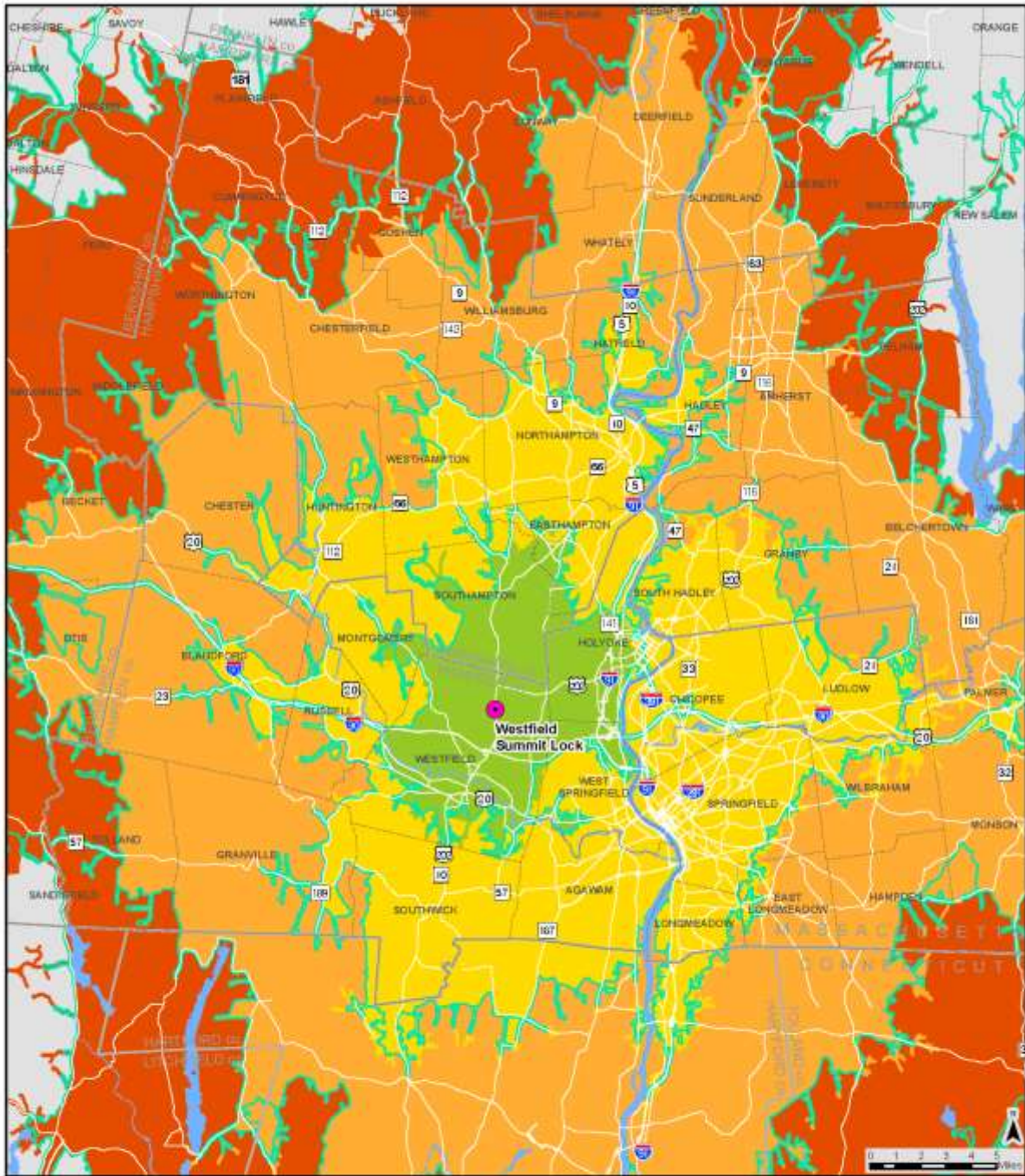
Drive Time Areas

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

December 2018

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

Figure 8-10 - Travel Time Contours for Westfield Summit Lock



Central Business District Drive Times

(Calculated May 2023, using average traffic conditions for Wednesdays 8am)

WESTFIELD, MA

Drive Time Areas

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

December 2018

- 0 - 15 minutes
- 15 - 30 minutes
- 30 - 45 minutes
- 45 - 60 minutes

Staffed utilized [Conveyal](#) which is a web based analysis tool to build travel time contours for pedestrians and cyclists. Two locations were selected for the analysis: Springfield CBD and Umass Amherst. These two locations were chosen for their proximity to off road facilities (CT Riverwalk in Springfield and the Umass connector of the Norrwottuck). As can be seen in Figures 8-11 and 8-12 non vehicular travel is becoming more and more feasible with addition of bicycle and pedestrian amenities and is expected to continue to improve as local and state policies are implemented.

Figure 8-11 - Walking and Bicycle Travel Times Contours (Umass)

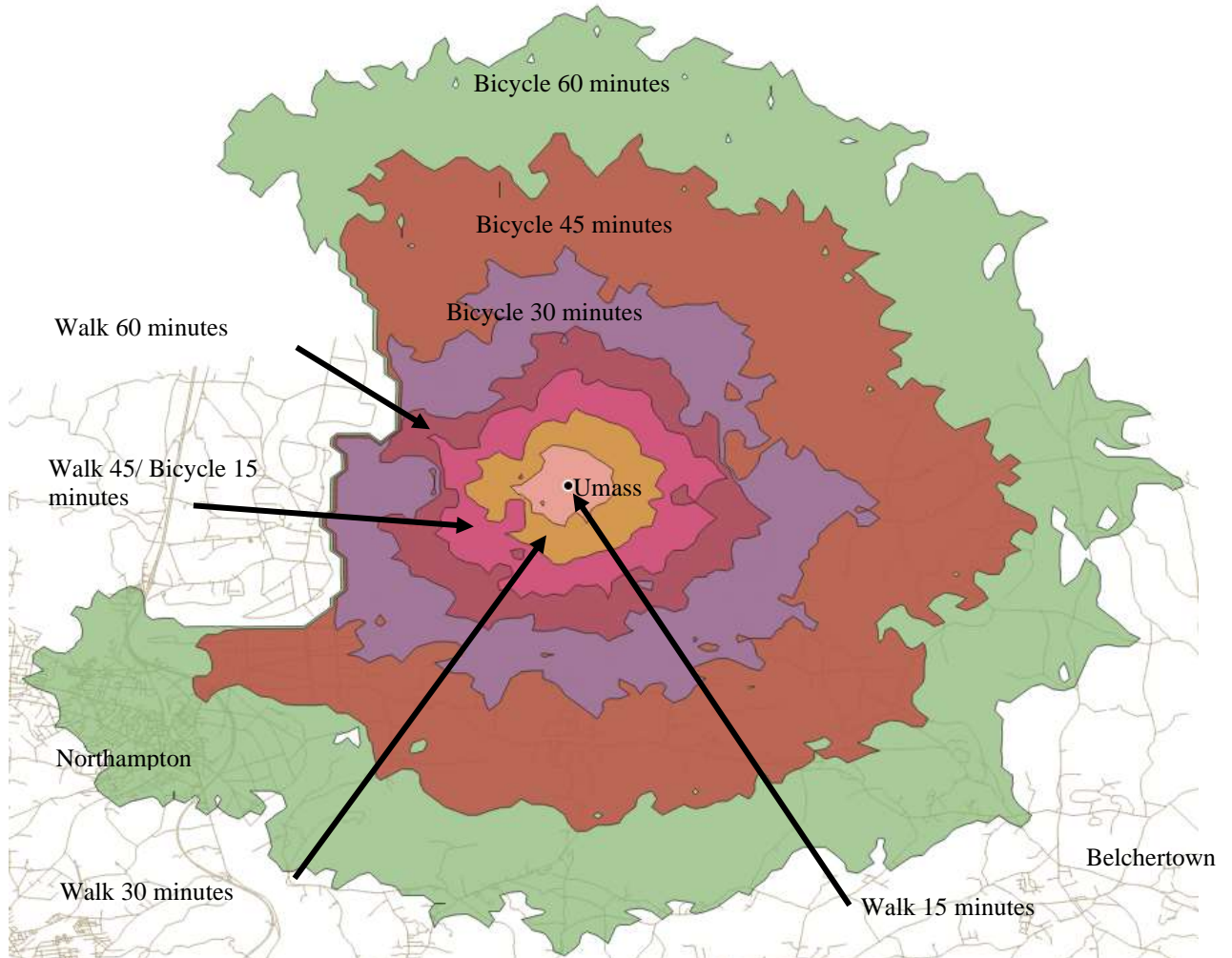
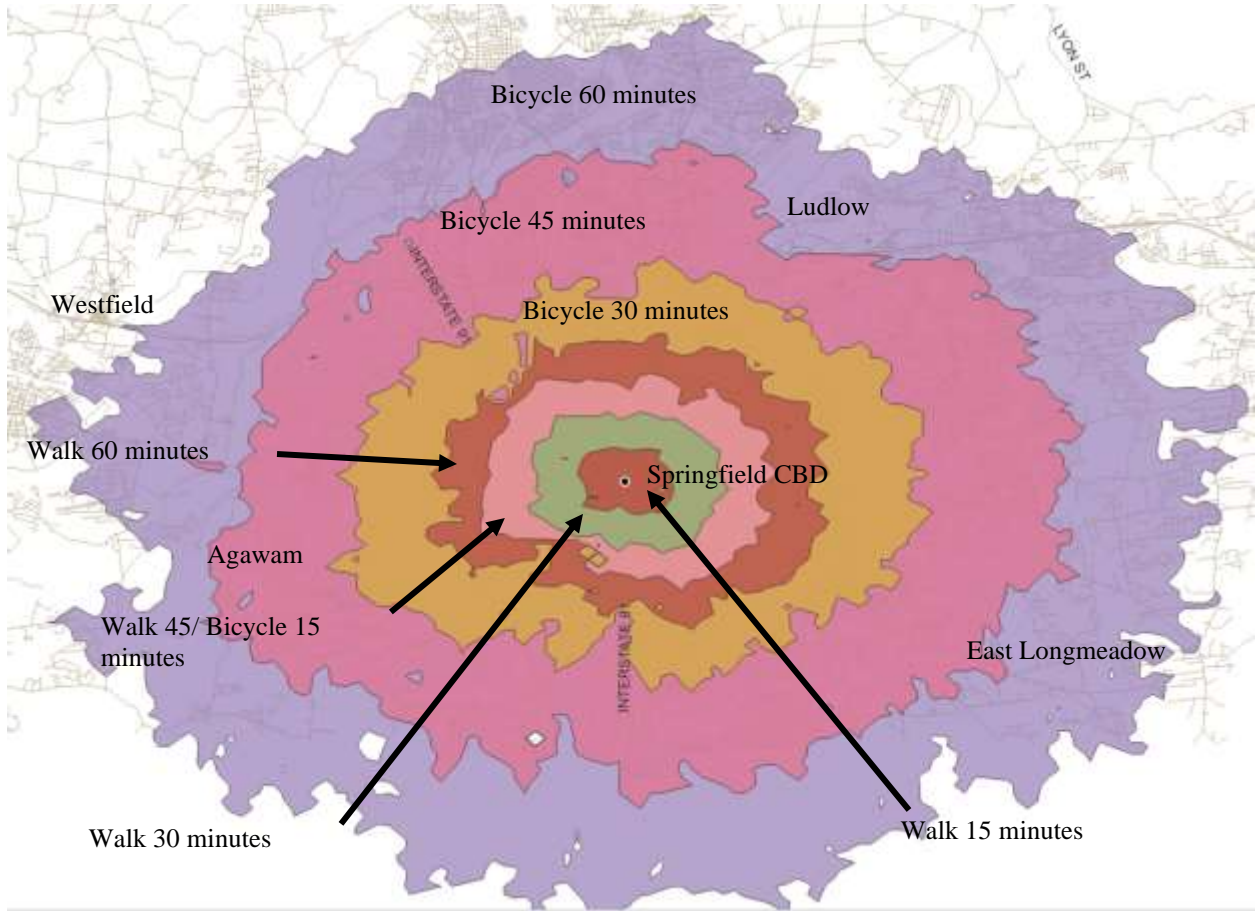


Figure 8-12 - Walking and Bicycle Travel Time Contours (Springfield)





9. PAVEMENT

A Pavement Management System (PMS) is a systematic process that collects and analyzes roadway pavement information for use in selecting cost-effective strategies for providing and maintaining pavements in a serviceable condition. The role of PMS is to provide an opportunity to improve roadway conditions and make cost-effective decisions on maintenance priorities and schedules.

A. REGIONAL EFFORTS AND PROCESS

The Pioneer Valley Planning Commission's (PVPC) regional PMS involves a comprehensive process for establishing the network inventory and project histories, collecting and storing pavement distress data, analyzing the data, identifying the network maintenance activities and needs and integrating the PMS information in the metropolitan and statewide planning processes. The Pioneer Valley region covers approximately 1,200 square miles, roughly the same size as the state of Rhode Island. The roadway network covered by the regional PMS includes all urban and rural Federal-Aid highways of the 43 cities and towns in the region. The Pioneer Valley region consists of approximately 1,300 miles of Federal-Aid eligible roadways. The Federal Highway Administration (FHWA) mandates that the Regional Planning Agencies (RPA) undertake a study to establish the cost of maintaining the Federal-Aid roadways that make up their regions with the expectation that the results of these studies will be incorporated in every update of the Regional Transportation Plan (RTP). The PVPC's regional PMS efforts have been ongoing since 1995, at which time the RPAs were complying with the requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. In an effort to continue to be in federal compliance, the PVPC has continued the regional PMS efforts. Staff have

collected and analyzed pavement distress data for all 43 cities and towns in the Pioneer Valley Region.

The PVPC utilizes the Operations Management Software (OMS) developed by Cartegraph Systems. The OMS uses a Road Condition Index (RCI) as a measurement of roadway serviceability and as a method to establish performance criteria. Since the PVPC only collects pavement distress information, the Overall Condition Index (OCI) produced by OMS was used for analysis purposes.

An OCI was generated for each inventoried roadway segment in the region using the pavement distress data collected by the PVPC staff. Deduct values assigned to each type of distress based on severity and extent were applied to generate an OCI for each roadway segment. OCI is measured from 0 to 100, with 100 being an excellent or perfect condition and zero being failure or impassable condition. The OCI values generated are grouped into OCI category ranges which are defined depending on the type and functional class of each segment. These OCI categories along with other factors, such as a Base Index, Average Curb Reveal, Functional Class and Pavement Type are used to assign a Repair Strategy for each of the defined segments.

The PVPC incorporates 6 default repair categories:

1. Reconstruction of Collectors and Arterials
2. Reconstruction of Locals (not used in regional efforts)
3. Rehabilitation
4. Preventive maintenance
5. Routine maintenance
6. No action

Reconstruction involves the complete removal and replacement of a failed pavement section which includes reclamation. For the most part, the cost per square yard differs for local roads as opposed to collectors and arterials. The rehabilitation of pavements includes the work necessary to restore the pavement to a condition that will allow it to perform satisfactorily for several years. Preventative maintenance activities are those which are performed at planned intervals to protect and seal the pavement. Routine maintenance activities are those which are taken to correct a specific pavement failure or area distress.

The following summarizes the findings of the region's surveyed federal-aid eligible roadways and recommends appropriate maintenance activities. A documented guideline of project priority, cost and recommended maintenance activity may be produced in a systematic and coordinated manner for the entire region. Project level analysis is conducted and highway maintenance projects are developed, the results of which are an integral part of the RTP and Transportation Improvement Program (TIP).

1. Existing Conditions

The PVPC staff surveyed approximately 1,280 miles of federal-aid eligible roadways in the Pioneer Valley region which was divided into 2,484 roadway segments.

Pavement distress data was collected for the entire Surface Transportation Program (STP) roadway network and select National Highway System (NHS) roadways. The average OCI for the surveyed roadways in the region is rated at 59, which indicates the majority of the roadways are in a fair condition. The average OCI information by community is depicted in Table 9-1.

Table 9-1 - Average OCI by Community

Community	Arterial Miles	Collector Miles	Federal Aid Miles	Average OCI 2024
Agawam	23.13	27.16	50.29	71
Amherst	43.97	6.50	50.47	51
Belchertown	33.79	13.05	46.85	45
Blandford	6.79	14.41	21.20	56
Brimfield	11.58	13.56	25.15	55
Chester	8.06	0.00	8.06	52
Chesterfield	7.71	7.79	15.51	61
Chicopee	45.35	15.71	61.06	53
Cummington	12.95	7.77	20.72	61
East Longmeadow	22.22	9.40	31.62	65
Easthampton	25.00	4.97	29.97	59
Goshen	5.40	3.71	9.11	71
Granby	17.86	3.98	21.83	39
Granville	8.80	5.71	14.51	43
Hadley	24.41	14.44	38.85	40
Hampden	5.69	6.95	12.63	73
Hatfield	6.63	8.06	14.69	63
Holland	0.00	11.45	11.45	59
Holyoke	41.43	20.90	62.33	47
Huntington	11.23	4.02	15.25	47
Longmeadow	14.27	4.88	19.15	74
Ludlow	26.01	9.82	35.83	55
Monson	14.11	17.28	31.39	59
Montgomery	0.00	5.20	5.20	62
Northampton	50.03	16.20	66.23	67
Palmer	31.00	12.52	43.52	60
Pelham	8.02	3.80	11.82	59
Plainfield	0.00	11.89	11.89	68
Russell	9.45	5.89	15.34	49
South Hadley	19.03	10.20	29.23	45
Southampton	12.26	7.81	20.07	65
Southwick	19.13	7.67	26.80	74
Springfield	110.75	46.97	157.71	68
Tolland	5.66	0.00	5.66	77
Wales	0.00	8.03	8.03	54
Ware	18.69	14.07	32.76	59
West Springfield	26.53	4.97	31.50	72
Westfield	48.19	16.08	64.26	58
Westhampton	0.00	19.63	19.63	60
Wilbraham	20.37	13.09	33.46	73
Williamsburg	19.31	0.00	19.31	51
Worthington	10.32	6.48	16.80	59

The OCI generated by OMS was used to establish pavement condition categories of “Excellent”, “Good”, “Fair”, “Poor”, and “Failed” with OCI ranges provided in Table 9-2.

Table 9-2 - Pavement Condition Range by Functional Class

	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Failed</u>
Arterial	>89.5	>69.5 and <=89.5	>48.5 and <=69.5	>25.5 and <=48.5	<=26.5
Collector	>88.5	>68.5 and <=88.5	>47.5 and <=68.5	>24.5 and <=47.5	<=24.5

The results indicate that most of the region’s surveyed federal-aid eligible roadways are in fair condition. Figures 9-1 and 9-2 depict the region’s pavement condition graphically by functional classification. As shown, the region’s arterial and collector roadways follow a similar pattern with regards to pavement condition. The region’s surveyed federal-aid roadways consist of 825 miles of arterial and 445 miles of collector roadways. The percentages are 65% and 35% respectively.

Figure 9-1 - Pavement Condition of the Region’s Arterial Roadways

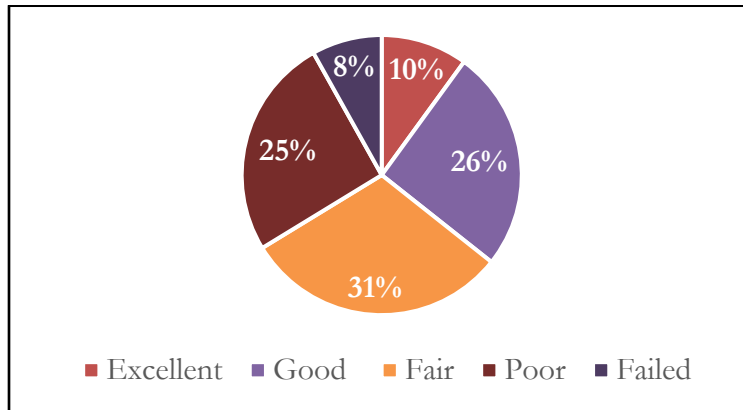


Figure 9-2 - Pavement Condition of the Region’s Collector Roadways

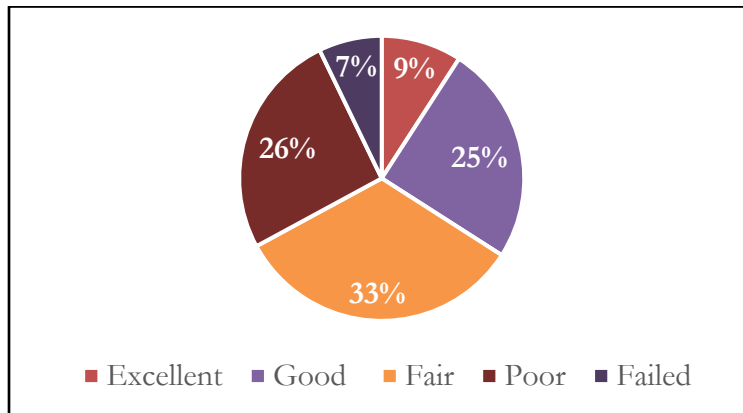
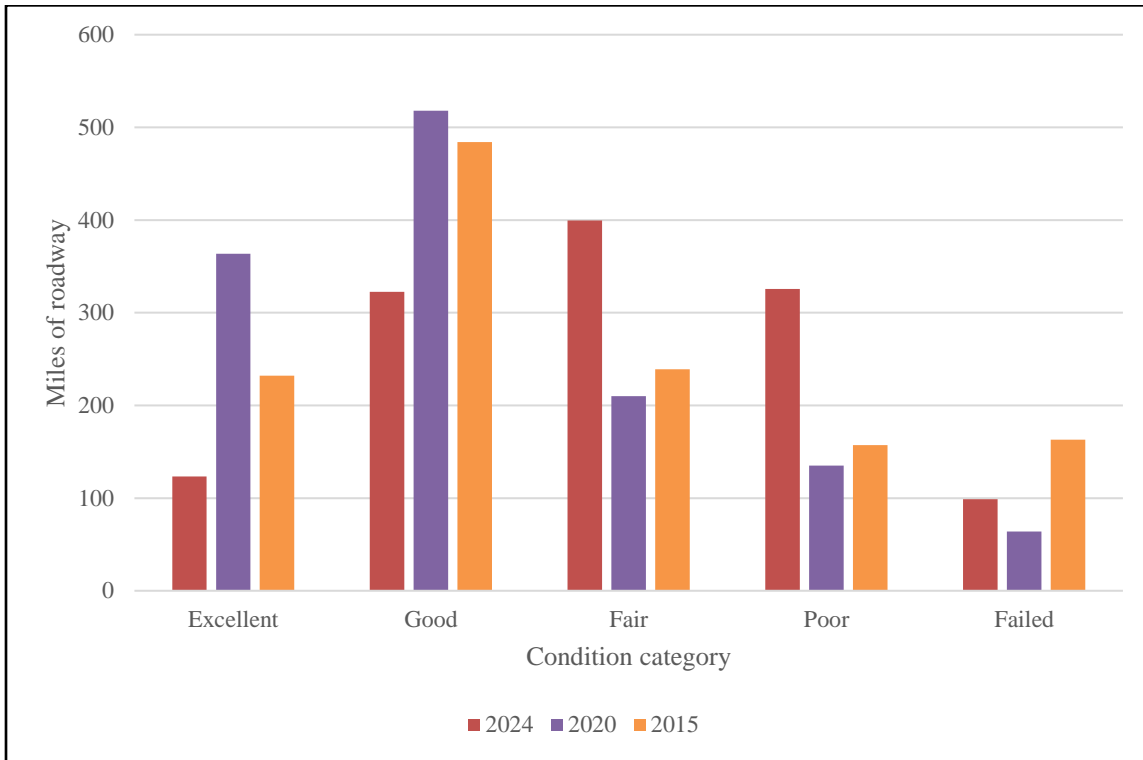


Figure 9-3 shows a comparison of the number of miles of surveyed arterial and collector roadways by pavement condition to the 2020 and 2015 RTP data. Figure 9-3 indicates a changing trend in overall pavement condition, reflecting a lower overall condition than in previous years.

Figure 9-3 - Overall Road Condition Comparisons by Miles



2. Regional Roadway Improvement Needs

The budgeting process of OMS can be used to calculate the backlog of repair work for the region by assigning 100% of roadway segments within the best OCI range. The backlog is defined as the cost of bringing all roads up to a near perfect condition within one year.

The backlog represents how far behind the roadway network is in terms of its present physical condition and measures the cost of performing all desirable repairs to achieve the best OCI range. In the middle of the current year, the backlog repair work for the Pioneer Valley Region was \$244,769,102. This cost estimate is useful in identifying the pavement condition of the system at the end of the current year and when comparing it to future and/or past year's backlogs.

After the backlog of improvement needs have been determined, the recommended maintenance actions for roadway segments may be ranked by priority. The priority

of segment improvement is determined based on its calculated Network Priority Ranking (NPR). NPR is a function of vehicle volume, roadway length, estimated life of repair, improvement cost, and OCI. It is a measurement of the benefit/cost ratio for each segment improvement recommendation. NPR is used to rank roadway projects based on a priority scale. The projects with a higher NPR are assigned a higher priority and projects with a lower NPR are assigned a lower priority. The roadway segments with the same NPR are assigned the same priority ranking and segments with no NPR are not assigned a priority ranking.

Table 9-3 summarizes the region's backlog of Federal-Aid eligible roadway repair work by community. The table also provides information on how far behind each community is as far as backlogs of reconstruction and resurfacing work are concerned. In highway maintenance, roadway resurfacing involves an overlay of pavement at a uniform thickness. Conversely, roadway reconstruction consists of the complete removal and replacement of a failed roadway surface. Reconstruction is more comprehensive and expensive as it also involves replacement of the base material for the roadway.

The backlog of repairs also includes routine and preventive maintenance activities such as crack filling, sealing, and patching. In Table 9-3, the total backlog does not always add up to the total of the estimated reconstruction and resurfacing activities. This is due to the addition of routine maintenance activities and the table only includes backlog estimates for the federal aid eligible roadway system. Backlog estimates for the Town of Tolland only consist of estimates of routine maintenance activities for their federal aid eligible roadways. It is also important to note that the region's total resurfacing backlog is approximately 25% higher than its reconstruction backlog.

Table 9-3 - Backlog of Repair Work by Community

Community	Backlog	Reconstruction	Resurfacing
Agawam	\$4,270,025.98	\$0.00	\$1,543,990.00
Amherst	\$13,889,904.67	\$8,579,560.00	\$4,040,784.00
Belchertown	\$12,059,123.16	\$3,654,130.00	\$6,982,068.00
Blandford	\$4,391,683.56	\$3,426,400.00	\$0.00
Brimfield	\$3,440,891.27	\$0.00	\$1,636,056.00
Chester	\$1,531,486.64	\$349,180.00	\$352,896.00
Chesterfield	\$1,571,717.99	\$0.00	\$0.00
Chicopee	\$20,964,575.12	\$7,564,325.00	\$10,764,084.00
Cummington	\$2,190,451.73	\$0.00	\$1,408,968.00
East Longmeadow	\$4,190,230.40	\$202,140.00	\$2,949,636.00
Easthampton	\$4,597,374.15	\$1,161,390.00	\$1,610,856.00
Goshen	\$699,455.89	\$0.00	\$287,040.00
Granby	\$7,053,614.22	\$3,468,410.00	\$3,512,228.00
Granville	\$3,896,965.83	\$982,700.00	\$2,674,404.00
Hadley	\$14,616,916.89	\$10,128,580.00	\$3,617,620.00
Hampden	\$826,129.56	\$0.00	\$411,484.00
Hatfield	\$1,625,796.72	\$0.00	\$709,032.00
Holland	\$1,086,324.25	\$0.00	\$610,764.00
Holyoke	\$18,306,374.00	\$2,700,980.00	\$12,277,622.00
Huntington	\$3,583,310.11	\$2,296,295.00	\$118,358.00
Longmeadow	\$1,672,719.69	\$52,800.00	\$688,010.00
Ludlow	\$8,838,543.04	\$3,977,650.00	\$3,816,158.00
Monson	\$3,532,767.18	\$47,520.00	\$2,407,804.00
Montgomery	\$842,397.01	\$800,160.00	\$0.00
Northampton	\$7,341,447.02	\$0.00	\$1,382,916.00
Palmer	\$9,270,662.19	\$4,371,745.00	\$2,738,560.00
Pelham	\$1,888,287.33	\$0.00	\$988,704.00
Plainfield	\$954,959.50	\$0.00	\$192,780.00
Russell	\$4,420,539.73	\$3,162,520.00	\$771,748.00
South Hadley	\$10,521,825.38	\$5,888,910.00	\$3,749,030.00
Southampton	\$2,981,908.28	\$1,252,800.00	\$1,331,608.00
Southwick	\$2,050,280.63	\$108,465.00	\$962,218.00
Springfield	\$23,155,348.48	\$2,651,320.00	\$9,594,646.00
Tolland	\$375,501.67	\$0.00	\$0.00
Wales	\$1,741,486.67	\$1,570,900.00	\$0.00
Ware	\$5,542,785.91	\$1,328,355.00	\$2,594,096.00
West Springfield	\$5,580,880.30	\$1,209,740.00	\$2,647,848.00
Westfield	\$15,169,067.84	\$6,256,015.00	\$5,187,452.00
Westhampton	\$2,504,220.23	\$0.00	\$1,152,342.00
Wilbraham	\$3,313,940.77	\$0.00	\$1,658,744.00
Williamsburg	\$3,464,739.30	\$784,700.00	\$1,877,332.00
Worthington	\$2,564,224.66	\$0.00	\$2,530,068.00
Region Totals	\$244,769,101.70	\$80,195,380.00	\$101,779,954.00



10. SUSTAINABILITY

In the Pioneer Valley we are driven by the 1987 United Nations Bruntland Commission definition of sustainability as we work to “meet the needs of the present generation without jeopardizing the ability of future generations to meet their own needs.”⁶ With respect to our natural world, as was viscerally experienced in early June 2023 when smoke from Canadian forest fires (caused in part by human’s failure to reduce GHG emissions) blanketed the Northeast with dangerous levels of air pollution, we are all being and will continue to be affected by the actions, and failures to act, of ourselves and our neighbors—regionally, in the Commonwealth, nationally and internationally. We must reduce GHG emissions now to enable our future generations to live as comfortably on the earth as we have been able to live.

Since the release of our 2005 Clean Energy Plan the Pioneer Valley has actively supported the Commonwealth of Massachusetts Greenhouse Gas (GHG) emissions reductions goals, and we continue to work toward 33% reductions in 1990 GHG emissions levels by 2025 and 50% GHG emissions reductions by 2030, with a 2050 goal of net zero GHG emissions. We applaud the Commonwealth and MassDOT’s commitment to 18% reductions in the Transportation sector by 2025 with an additional 34% reductions by 2030.

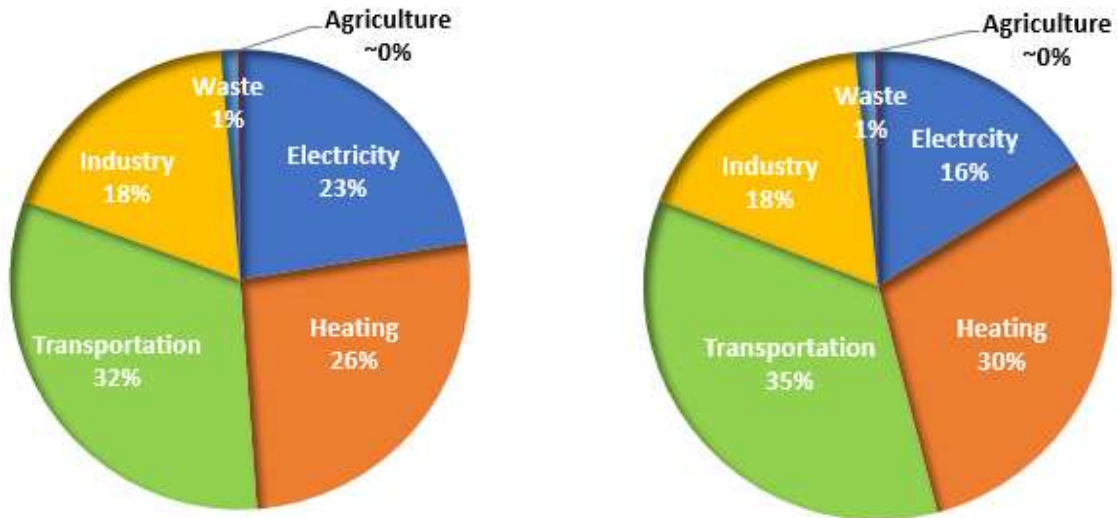
From 2010 to 2017 the Pioneer Valley region decreased GHG emissions by an estimated 19%. GHG emissions in 2010 totaled 9.2 million metric tons of carbon dioxide equivalent (MTCO_{2e}) and 8.1 million MTCO_{2e} in 2017.

⁶ [Report of the World Commission on Environment and Development : \(un.org\)](https://www.un.org/en/content/dam/repofirst/images/00/00_4682main.pdf)

Figure 10-1 – 2010 Vs. 2017 GHG Emissions in the Pioneer Valley

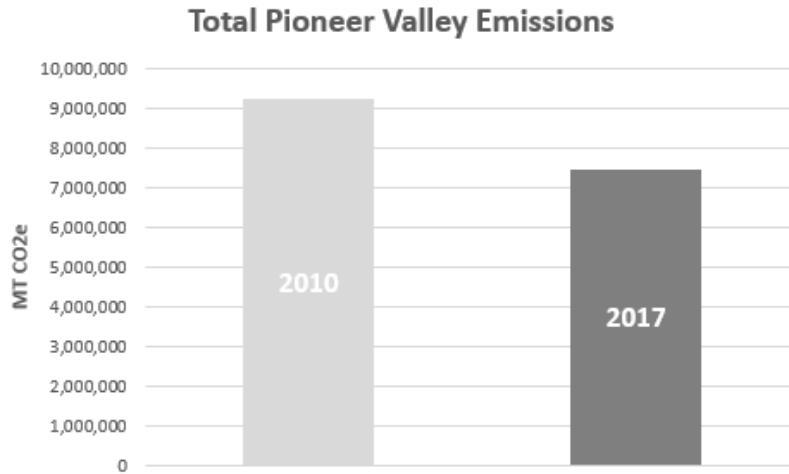
2010 Pioneer Valley GHG emissions: **9.2**
million MTCO₂e

2017 Pioneer Valley GHG emissions: **8.1**
million MTCO₂e



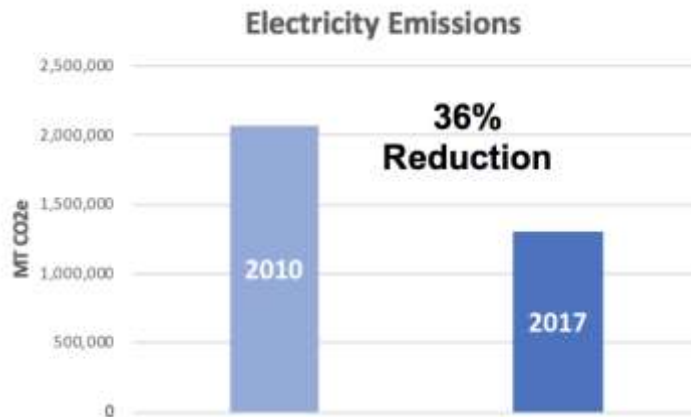
The emissions decrease resulted from a combination of (1) real reductions in emissions over the 7 years, and (2) shortcomings in the methodology used in the 2010 inventory, which resulted in inaccurate tracking of emissions and changes in emissions over time. For example, estimated GHG emissions in the electricity sector decreased between the 2010 inventory and the 2017 inventory. This reduction was in part due to a real reduction in the electric grid emissions factor (i.e., the amount of GHG emissions per MWh of electricity used) over that 7-year period, which was likely associated with a transition away from coal and toward renewables and natural gas for electricity production in New England. However, the 2010 inventory used the 2005 electric grid emissions factor, while the 2017 inventory used the 2018 electric grid emissions factor, thus reflecting a change in the emissions factor over a 13-year period, rather than a 7-year period. A more accurate comparison could be made using the 2011 electric grid emissions factor to estimate emissions for the 2010 inventory and comparing these emissions to the value calculated for 2017 using the 2018 factor. This calculation would still show a reduction, but smaller than the values calculated here (approximately a 24% reduction in electricity emissions rather than 36%).

Figure 10-2 – 2010 Vs. 2017 Total Pioneer Valley GHG Emissions Reduction



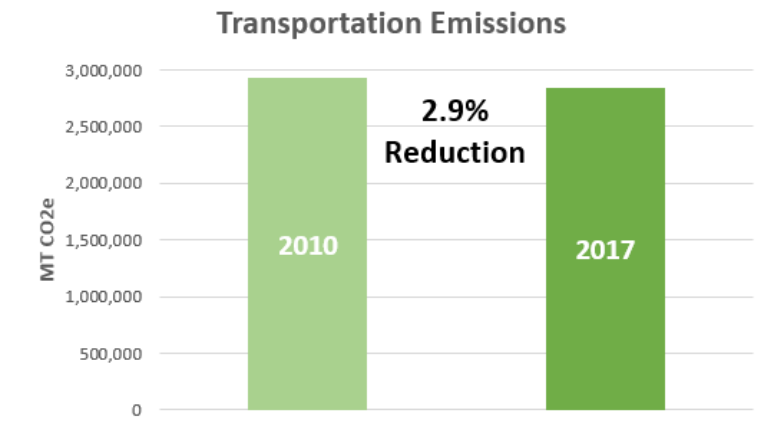
As shown below, we identified a significant (36%) reduction in GHG emissions from electricity from 2010 to 2017. This emissions decrease occurred despite an approximately 4.4 increase in electricity consumption during the same period. This decline is therefore due to a reduction in the electric grid emissions factor (i.e., the amount of GHG emissions per MWh of electricity used). This is likely associated with a transition away from coal and towards renewables and natural gas for electricity production in New England.

Figure 10-3 - 2010 Vs. 2017 Total Pioneer Valley Electrical Emissions Reduction



As shown below, we identified a slight (2.9%) reduction in GHG emissions from transportation fuels between 2010 and 2017. Average fuel efficiency of cars increased by about 8% between the two inventories, while light truck fuel efficiency, vehicle composition, and vehicle miles traveled (VMT) changed very little.⁷

Figure 10-4 - 2010 Vs. 2017 Total Pioneer Valley Transportation Emissions Reduction



PVPC has goals consistent with the MA statement in Secretary Card’s letter of determination⁸, focusing on “electrify everything” (buildings and vehicles) and “green the grid”. This has been PVPC’s focus since our 2005 Clean Energy Plan and the region and the PVPC are working to assist businesses and residents to complete the transition to heat pumps and electric vehicles. Our December 2017 report, “[Pioneer Valley Electric Vehicle Charging Station Plan/Guide](#)” describes our work to facilitate the transition to EVs.

We are working to assure that our transportation system is facilitating our regional sustainability goals:

- Affirmatively furthering improved access to opportunity for people in the region who have been left out/kept out.
- Sustainably growing our regional economy and respecting/nurturing the environment while maintaining/developing resilient thriving communities.

⁷ We obtained the total number of vehicles (by vehicle type and by region) in the Pioneer Valley from the Massachusetts Department of Revenue⁷, and determined total regional VMT from the VMT by county from the Mass Department of Transportation’s Data Viewer.⁷ Next, we assigned VMT in the PV region to each vehicle type according to the percentage of total vehicles of each vehicle type, and calculated the fuel used to travel those miles using average 2018 fuel efficiency values (MPG) from the Alternative Fuels Data Center⁷. Using EPA emissions factors, we determined the GHG emissions associated with that fuel use. Finally, the annual VMT by the Pioneer Valley Transportation Authority (PVTA) was obtained from the 2017 PVTA annual report.⁷ We then multiplied the PVTA VMT values by the average fuel economy of a bus (6 MPG) and the appropriate GHG emissions factor to obtain total PVTA GHG emissions. This value was added to the total for the region to yield the total MTCO₂e.

⁸ <https://www.mass.gov/doc/determination-letter-for-the-2050-cecp/download>

Our long-standing commitment to advancing pedestrian and bicycling infrastructure has been catalyzed by the Commonwealth's commitment to complete streets and our region's integrated approach to environmental conservation and protection aligns with the Commonwealth's. Our region was the first to launch a bike commute week, eventually taken over by the Commonwealth and we were also the first region to launch a 100% electric bike-sharing system, ValleyBike. We are also one of a select few pilot projects in the Massachusetts Clean Energy Centers' Act4All Electric Bikes project, working to distribute no cost e-bikes to economically and structurally disadvantaged residents in our region.

Smart growth remains an integral element of our region's work to reduce GHG emissions and facilitate a sustainable future. Our Valley Development Council has been overseeing our regional land use plan for decades promoting compact, mixed-use development in and around existing urban and town centers while protecting open space and natural resources.

11. LIVABILITY AND CLIMATE CHANGE

A. OVERVIEW

Massachusetts continues as a leader in the country with respect to working actively to address our changing climate, and the Commonwealth provides detailed data and information to frame necessary action to both aggressively reduce GHG emissions and manage risk by mitigating the impact of increasingly severe and unpredictable weather events. The Commonwealth's 2022 Climate Change Assessment provides specific information to understand the impacts of the climate crisis in our region, pointing the way to action. As stated in the 2022 State Climate Action Plan, Massachusetts has led the nation in climate action over the last eight years.

B. RECENT ACTIONS

Since 2016 Massachusetts has:

- Invested over \$1 billion in climate initiatives through the Executive Office of Energy and Environmental Affairs (EEA) and its agencies in order to implement mitigation and adaptation efforts.
- Launched the extremely popular and effective Municipal Vulnerability Preparedness Program, which over 97% of communities representing nearly the entirety of the Commonwealth's population are enrolled in and have been awarded over \$100 million since 2017, to support local climate resilience and adaptation projects.
- Implemented the State Hazard Mitigation and Climate Action Plan (SHMCAP), which is a nation-leading effort to comprehensively integrate climate change impacts and adaptation strategies with hazard mitigation planning; and,

- Convened the Resilient MA Action Team (RMAT), an inter-agency steering committee responsible for implementation, monitoring, and maintenance of the SHMCAP. The RMAT has developed a climate resilience design standards online tool to facilitate the application of statewide climate data to the planning and design of capital projects and has been applied annually across municipal grant infrastructure programs and the capital planning process.
- In 2021 and 2022, then Governor Baker signed comprehensive climate change legislation that codified into law Massachusetts commitment to reach Net Zero emission in 2050 and furthered the Commonwealth’s nation-leading efforts to combat climate change and protect vulnerable communities.

C. MASSACHUSETTS CLIMATE CHANGE ASSESSMENT

In 2022 the Commonwealth released the MA Climate Change Assessment. This is a very useful concise illustrated statement of the impacts we can anticipate and mitigate by our actions.

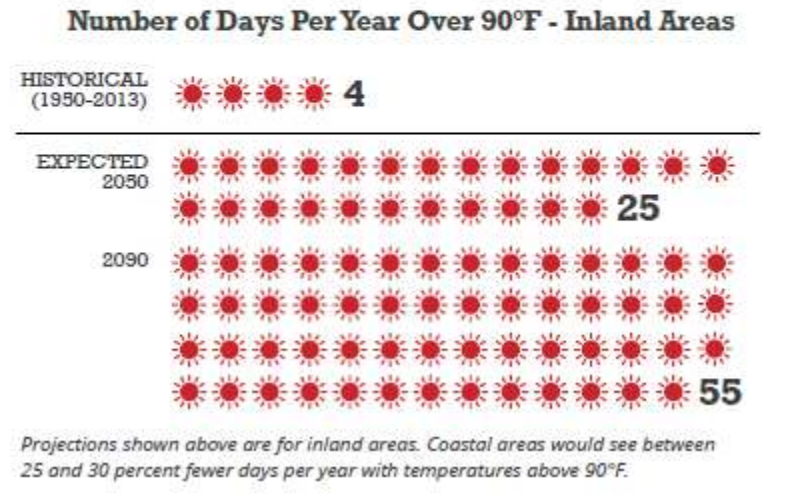
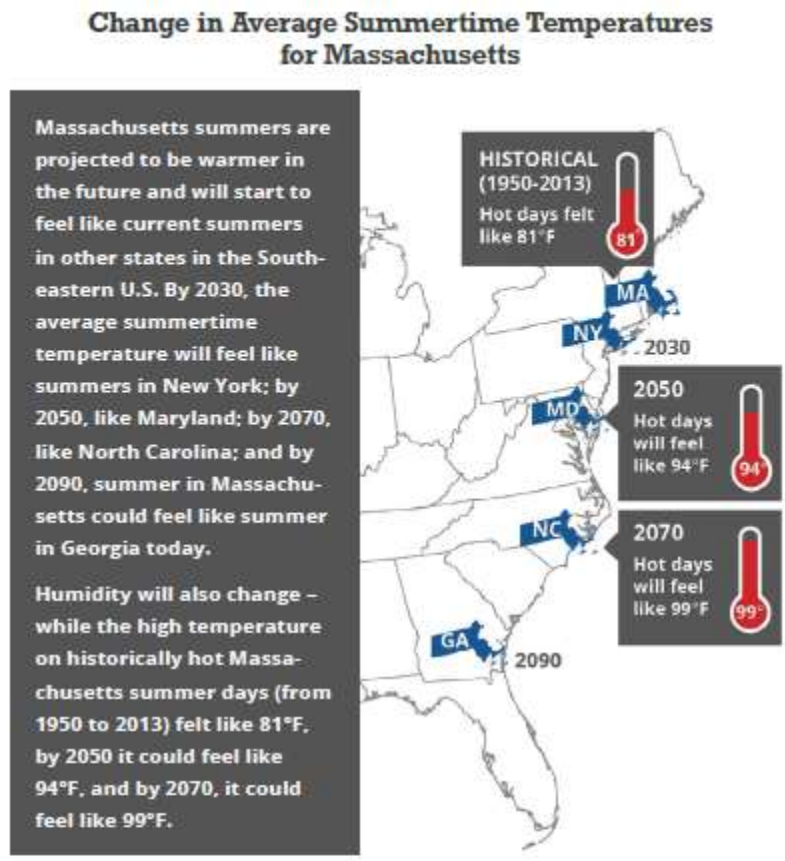
Figure 11-1 – Impact of Climate Change in Massachusetts

2030	2050	2070	2090
<p>NEAR TERM The summer mean temperature could increase by 3.6°F from the historical period (1950-2013), increasing urban heat stress and reducing local crop yields.</p>	<p>MID-CENTURY The 1 percent annual chance river flood could be three times more likely to occur, increasing Connecticut River and other area flood risk.</p>	<p>MID-LATE CENTURY There could be 65 fewer days below freezing, increasing the chance of ticks overwintering and reducing winter recreation opportunities.</p>	<p>END OF CENTURY The historical 10 percent annual chance daily rainfall event (2.6 to 4 inches) could occur four times more frequently.</p>



Source: 2022 Massachusetts Climate Change Assessment

Figure 11-2 – How Could Climate Hazards Change in Massachusetts



Source: 2022 Massachusetts Climate Change Assessment

Figure 11-3 – Climate Change Impacts on Infrastructure

IMPACT	DESCRIPTION	MAGNITUDE	DISPROPORTIONATE EXPOSURE	ADAPTATION GAP
Damage to Inland Buildings (MOST URGENT)	Addresses the risk of flooding to inland structures from rainfall (pluvial flooding) when drainage systems are overwhelmed by large rainstorms and rivers (fluvial flooding).	Major	Disproportionate	Moderate
Damage to Electric Transmission and Utility Distribution Infrastructure (MOST URGENT)	Costs to repair transmission infrastructure failure associated with heat stress and extreme events that directly affect the transmission and distribution system. Includes wired communication and information technology systems.	Major	Potential	Extreme
Damage to Rails and Loss of Rail/Transit Service (MOST URGENT)	Extreme temperature events reduce useful life of track and cause buckling events, which also lead to indirect impacts from delays that occur due to track buckling and repair. Also addressed are effects of storms and sea level rise on subway and commuter rail operation.	Moderate	Disproportionate	Moderate
Loss of Urban Tree Cover	Urban trees are susceptible to invasive pests and high heat/drought conditions and provide many services including mitigating heat island effects, pollution removal, etc.	Moderate	Disproportionate	Minimal
Damage to Coastal Buildings and Ports	Sea level rise, coastal erosion, and storm surge, as well as high wind events from tropical and extra-tropical storms, will cause increased damage to coastal structures, land, and related infrastructure such as ports and marinas.	Extreme	Limited	Moderate
Reduction in Clean Water Supply	Addresses changes in water quantity and quality for water supplied for all human uses. Changes in precipitation patterns and saltwater intrusion can lead to impaired surface and groundwater supply available for municipal, industrial, commercial, and agricultural uses.	Major	Potential	Minimal
Damage to Roads and Loss of Road Service	Damage to roads from extreme precipitation, flooding, and temperature increases the need for repair and maintenance, and indirect effects of increased vehicle operating costs from driving on roads in poor condition. Includes effects on bridges and culverts at road crossings.	Major	Limited	Moderate
Loss of Energy Production and Resources	Changes in temperature increase electricity demand and reduce production efficiency, requiring changes in the overall network cost of meeting electric demand. Effects on solar energy production potentially subject to flooding are also considered.	Moderate	Limited	Minimal
Increased Risk of Dam Overtopping or Failure	Climate change could lead to more frequent overtopping of High or Significant Hazard dams, causing flooding of downstream areas.	Minimal	Limited	Minimal

Source: 2022 Massachusetts Climate Change Assessment

1. Increase in Costs of Responding to Climate Migration

The lower level of exposure to some climate hazards such as coastal impacts could make the Pioneer Valley region a potential location for climate migration from eastern parts of Massachusetts or other parts of the United States. This could place an added cost on local government to accommodate and prepare for future climate migration.

2. Increase in Demand for State and Municipal Government Services

Demands resulting from climate change and climate migration also impact the resources provided by municipal government. Increases in local population require a greater investment in emergency response, capital equipment, operating budgets, and maintenance.

D. COLLABORATIONS

As one of the Commonwealth's most effective collaborators PVPC advances MVP and Green Communities certification and Action grants. In 2022-23 PVPC facilitated completion of GHG emissions inventories for 11 of our member municipalities as well as net zero scoping work for an additional six cities and towns. This work is funded by the MA DOER and included a collaboration with UMASS CEE. As part of Massachusetts MVP Action Grant work PVPC is leading a three-town project to understand the impacts of the climate crisis on dirt roads in Blandford, Chester and Middlefield. This work builds on Huntington's previous MVP Action grant and is going to be featured by the National Association of Development Organizations in a pending publication.

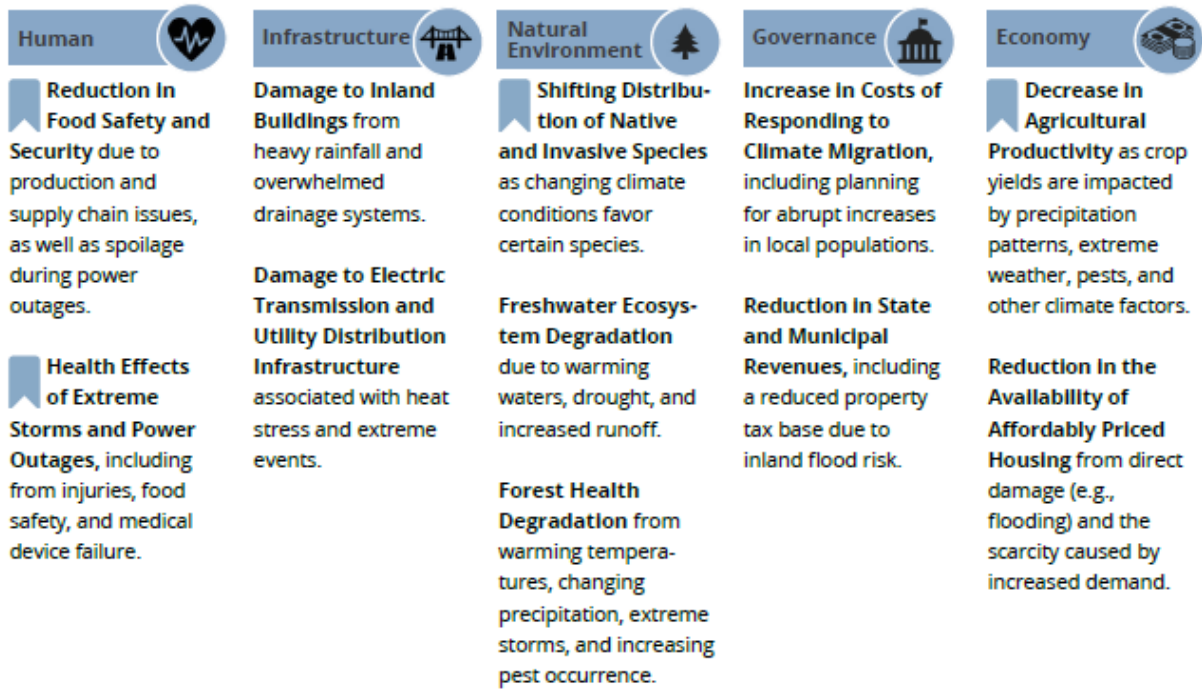
PVPC also has a long history of collaborating with the MA Clean Energy Center (its predecessor, the MA Technology Collaborative funded our first Clean Energy Plan in 2006) including our current work in the Act4All program, collaborating with seven community-based organizations in the communities hosting ValleyBike stations to distribute e-bikes to their constituents. As reported in the MA Climate Change Assessment Regional Reports, the Pioneer Valley, also referred to as the Greater CT River Valley (including Hampden, Hampshire and Franklin Counties), accounts for about 11 percent of the state's population but includes nearly 21 percent of its low-income block groups. Overall, more than 52 percent of the Greater Connecticut River Valley's block groups receive EEA's environmental justice designation, making the region one of only two where more than half the block groups are considered socially vulnerable.

Figure 11-4 – Climate Change Impact on Government

IMPACT	DESCRIPTION	MAGNITUDE	DISPROPORTIONATE EXPOSURE	ADAPTATION GAP
Reduction in State and Municipal Revenues (MOST URGENT)	State and municipal revenue streams impacted through property tax loss following structure damage of any type, from any hazard, and income and sales tax losses associated with business interruptions or effects on industrial activities.	Major	Disproportionate	Moderate
Increase in Costs of Responding to Climate Migration (MOST URGENT)	Costs and stresses to governments accommodating and/or preparing for forced and voluntary human migration of populations in response to climate threats or related economic pressures. Includes intra-state, inter-state, and international in- and out-migration and is generally more abrupt than routine population changes in response to non-climate stressors (such as economic development or decline).	Major	Potential	Extreme
Increase in Demand for State and Municipal Government Services (MOST URGENT)	Climate change serves as a threat multiplier, which can increase the need for expenditures to meet existing government service. Examples include capital, equipment, or operating costs for emergency response provision and state sponsored health programs.	Major	Potential	Moderate
Damage to Coastal State and Municipal Buildings and Land	Risk to vulnerable state and municipally owned structures and other property from coastal flooding, wind, extreme heat, and extreme storms. Includes damage repair costs and service losses during closures.	Major	Limited	Moderate
Increase in Need for State and Municipal Policy Review and Adaptation Coordination	State agencies and municipalities may require additional full-time employees and specialized training to meet the challenges of climate change. Specifically, state and municipal staff will need capacity to provide adaptation planning support and to review and modify policies in response to changing conditions and uncertainty associated with climate change.	Minimal	Potential	Minimal
Damage to Inland State and Municipal Buildings and Land	Risk to vulnerable state and municipal owned structures and other property from flooding, extreme heat, and extreme storms. Includes damage repair costs and service losses during closures.	Minimal	Limited	Minimal

Source: 2022 Massachusetts Climate Change Assessment

Figure 11-5 – Impacts by Sector for the Greater Connecticut River Valley Region



Source: 2022 Massachusetts Climate Change Assessment

Of course we continue to catalyze and facilitate smart growth, the original climate action, assisting our cities and towns with comprehensive planning, housing production plans, local land use regulatory reform, open space and recreation plans, and economic development planning to guide growth and development where infrastructure exists and to create density, mixed uses, tree-lined streets, and other green infrastructure that reduces need for heating and cooling and minimizes the need to travel long distances to meet basic needs. Much of this work is funded by the District Local Technical Assistance Program, Land Use Planning grants, as well as municipal funding and MVP Action grants.

The Greater Connecticut River Valley contains some of the state’s most important freshwater resources. In addition to the Connecticut and its tributaries, the region is home to the Quabbin Reservoir, which provides clean water for municipal and industrial uses across the Commonwealth, though to relatively few communities within the Greater Connecticut River Valley region. PVPC has been leading efforts to clean up the CT river over the last 35 years, in collaboration with Springfield, Holyoke and Chicopee.

E. EXISTING POLICIES - PROGRAMS

As noted, the Commonwealth is a leader with respect to forward-thinking climate action policies, which are developed into programs by staff at MassDOT, EOEEA and other state agencies and departments. Since the watershed year of 2008, when the Global Warming Solutions Act, the Green Communities Act, and the GHG emissions impact assessment required by MEPA went into effect, Massachusetts has been using a strong combination of regulation, legislation, incentives, requirements, technical assistance and support to achieve necessary GHG emissions reductions to maintain Massachusetts livability, as exemplified by both the relatively new Complete Streets and the Municipal Vulnerability Preparedness (MVP) programs.

Today the GWSA still provides a strong foundation on which the state's current efforts have been built (weblink). Now risk management and adaptation to the changing climate have been built into how the Commonwealth does business. At the regional level in the Pioneer Valley, PVPC works with member municipalities to advance their participation in the State programs, as well as convening regular collaborations of public/private governments, organizations and institutions to work together to plan for and implement local policies and programs that can reduce the need to drive, facilitate use of clean transportation options-bus, rail, bike and on foot, and assure strong, safe transportation (and other) infrastructure in all our member municipalities.

1. Complete Streets

As detailed in Chapter 5, Massachusetts launched the Complete Streets program in 2014. Many Pioneer Valley communities are actively participating in the program and have committed to transforming our region's roads and streets to make them safe and comfortable for all road users. This has encouraged more people to walk, bike and use transit instead of driving a single occupant vehicle.

2. MEPA GHG Emissions Assessments

In 2007 Massachusetts started the process of integrating GHG emissions impact assessments into the Massachusetts Environmental Policy Act (MEPA). This policy was extremely innovative at the time and continues to play an important role in raising awareness of GHG emissions and educating people about how to mitigate impacts. As explained by the Commonwealth:

"The Executive Office of Energy and Environmental Affairs (EEA) has determined that the phrase "damage to the environment" as used in the Massachusetts Environmental Policy Act (MEPA) includes the emission of greenhouse gases caused by Projects subject to MEPA review. EEA now issues the following Greenhouse Gas Emissions Policy to fulfill the statutory obligation to take all feasible measures to avoid, minimize, or mitigate damage to the environment.

The Policy requires that certain Projects undergoing review by the MEPA Office quantify the Project's greenhouse gas (GHG) emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying Project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. EEA recognizes that this Policy will not itself avert climate change. However, this Policy is part of a larger effort to focus attention on the causes of climate change and harness creative thought and technology to implement long-term solutions.

EEA also recognizes that the GHG quantification required by this Policy will not result in absolutely accurate projections. The intent is not one hundred percent certainty as to the amount of GHG emissions; rather, it is a reasonably accurate quantitative analysis of emissions and potential mitigation that will allow the Project proponent and reviewers to assess the overall impact of the Project as proposed and the reduction in emissions if various techniques are used.

3. Municipal Vulnerability Preparedness (MVP) Program

Every city and town is encouraged, but not required, to accept funding from the State to undertake a Community Resilience Building (CRB) process to identify municipal vulnerabilities and strengths, and to develop a prioritized action plan to build on strengths and minimize and mitigate vulnerabilities through a MVP action grants.

A total of 36 member municipalities achieved MVP designation and another 5 are in progress. Statements of findings from all participating municipalities highlight the vulnerability of transportation infrastructure to extreme weather caused by our changing climate. In particular, concerns about undersized and poorly maintained culverts and bridges are being raised across all participating municipalities.

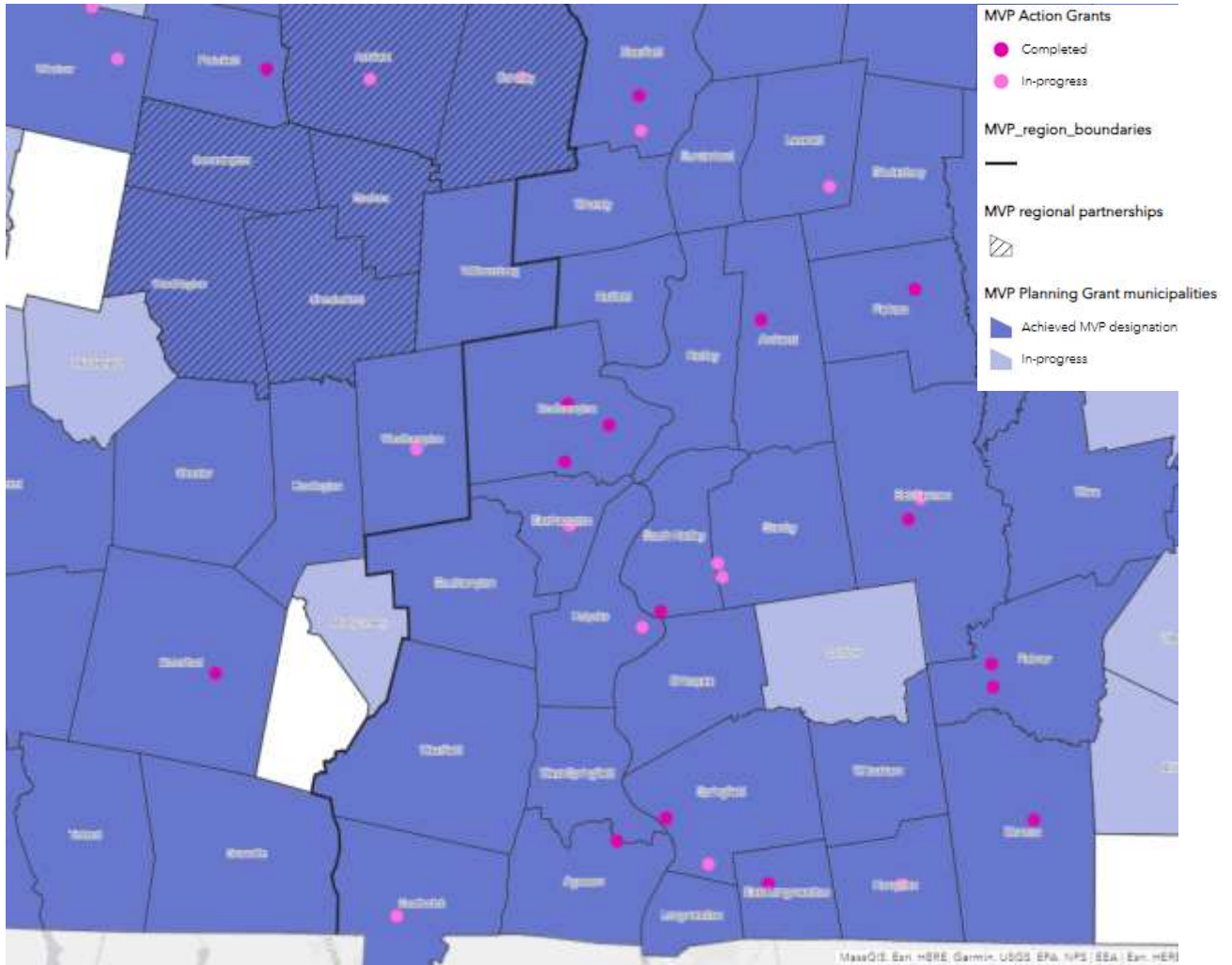
4. Green Communities

The [Green Communities Division](#) provides funding opportunities to reduce municipal energy use and costs by way of clean energy projects in municipal buildings, facilities, and schools; guidance, technical assistance, and local support from Regional Coordinators working out of the Massachusetts Department of Energy Resources (DOER). With respect to transportation, the program requires all participating municipalities to adopt a fuel-efficient vehicle policy that requires the purchase of energy efficient vehicles by the municipality. Bonus points are awarded as part of the regional Transportation Evaluation Criteria (TEC) for certified green communities.

This program is a "Lead by Example" initiative that shows residents and businesses in participating municipalities that it is possible to buy an energy efficient vehicle for most day to day uses and not suffer any negative consequences. There are 33 certified Green Communities in our region. Three additional communities are

working on certification. These communities have invested \$10,617,410 to make their communities more energy efficient and reduce GHG emissions.

Figure 11-6 – MVP Grant Program Status



5. Carbon Reduction Program

The BIL authorizes a new Carbon Reduction Program (CRP) to reduce transportation emissions through the development of State carbon reduction strategies and by funding projects designed to reduce transportation emissions. Sample eligible projects include:

- Traffic monitoring programs
- Bus rapid transit corridors or dedicated bus lanes.
- Construction of projects that facilitate non-motorized transportation.
- Congestion management technology

- Intelligent transportation systems (ITS) capital improvements
- Streetlight and traffic signal replacement with energy efficient alternatives.
- Congestion pricing improvements
- Reduction of the environmental and community impacts of freight movement.
- Deployment of alternative fuel vehicles.
- Diesel engine retrofits.
- Projects to improve traffic flow that are eligible under the CMAQ program.

Other projects that are not listed above may be eligible for CRP funds if they can demonstrate reductions in transportation emissions over the project's lifecycle. This potentially includes the use of sustainable pavement technology, use of highway right of way for solar arrays, and projects that accommodate and encourage mode shift.

a) MassDOT Carbon Reduction Strategy (CRS)

MassDOT developed a Carbon Reduction Strategy (CRS) to enable the funding of Carbon Reduction Program (CRP)-eligible programs and projects. The CRS aligns the use of CRP funds with the Massachusetts Clean Energy and Climate Plan for 2025/2030. Consistent with MassDOT's function as an investor in transportation infrastructure, their approach to the use of CRP funds will be to allocate them between programs that deliver on the following priorities:

- Support the electrification of public transit buses.
- Expand programs that make the Commonwealth's streets more complete.
- Build fast charging along major highway corridors.

6. Transportation Evaluation Criteria and Resiliency

Since the implementation of the current TEC in 2014 PVPC has reviewed and update the TEC three times to ensure TEC complies with the latest State and Federal requirements. The most recent review was performed in the Fall of 2022 to ensure the TEC aligned with the requirements of the Bipartisan Infrastructure Law (BIL). The MPO approved multiple TEC changes in the month of December in preparation for the development of the FFY 2024-2028 TIP. All projects included in the TIP have been evaluated and assigned a priority rating using the TEC scoring as adopted by the MPO. This process is used as a management tool to identify projects of regional priority and program them in the TIP. The TEC summary sheet can be found here: [Summary of the TEC scoring](#) and the Complete TEC form can be found here: [TEC Form](#). The TEC changes impacted several of the criteria that are link to resiliency, including the addition of the new Carbon Reduction Program, the summary of all changes can be found [here](#).

a) TEC Resiliency Scoring

- Encourages Development around Existing or Enhanced Infrastructure: 2 points.
- Prioritizes Transportation Investments that Support Land Use and Economic Development Goals: 1 point.
- Promotes Green Infrastructure and Low Impact Development to Reduce Stormwater Impacts: 2 points.
- Reduces Impervious Surfaces: 0.5 Points.
- Improves Air Quality: CMAQ Consultation Required. Major improvements include projects that demonstrate significant reduction in single occupant vehicles. Minor improvements include reductions in vehicle idling: 2 points.
- Improves Storm Resilience: 3 points.
- Carbon Reduction Program: 0.5 points.

As can be seen in the list of criteria linked to resiliency there are a total of 11 points (out of 100) that impact resiliency in the current version of the TEC. The current [Universe of Projects](#) includes 44 projects in various states of design being considered for funding through the TIP. Based on the TEC as well as other State initiatives it is expected that all 44 projects when constructed will have a positive impact on resiliency.

F. NEW/RECOMMENDED POLICIES

In addition to ongoing regional work to mitigate the impacts of climate change, a number of other programs and policies could improve and expand on existing efforts. These include:

- Regional Ballot Initiatives could be effectively used in Massachusetts to expand funding available for transportation innovations—necessary to reduce GHG emissions from transportation.
- Continued expansion of funding to offset the cost of electric vehicles (EVs) and e-bikes, especially targeted funding for economically and structurally disadvantaged people.
- All new construction should be required to have EV charging available at the same rate as parking spaces are required. Best practices such as the use of solar canopies in parking lots should be considered to the extent practical.

1. Our Next Future

Since 2014, PVPC has been facilitating implementation of our regional Sustainability plan, Our Next Future. Our Next Future was created to chart a course for a more vibrant, competitive, sustainable, and equitable region. This is a regional plan, designed to achieve success through promoting collaboration of communities on a regional basis. All total, five regional oversight groups, not counting the JTC, were

created to focus on: 1) smart growth, 2) clean energy and climate action, 3) housing, 4) cleaning the CT river, and 5) stormwater. All groups incorporate compliance with federal requirements. This work advances in close partnership and collaboration with our member municipalities, the business and economic development sector, educational, health care, insurance, clean energy and other key anchor institutions, residents, the not-for-profit sector, community-based organizations and the general public. These plans are available on our [website](#).

Resources:

Below is a list of websites and reports used in the development of this chapter update.

[Massachusetts Climate Change Assessment | Mass.gov](#)

[Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan | Mass.gov](#)

[Resilience - Sustainability - Environment - FHWA \(dot.gov\)](#)

[Resilient MA Climate Hub \(arcgis.com\)](#)

[Clean Energy and Climate Plan for 2025 and 2030](#)



12. PERFORMANCE MEASURES

A. INTRODUCTION

The BIL requires MPOs, in collaboration with the state DOT and transit agencies, to formally establish targets for performance measures aligned with the national goals. Performance Based Planning and Programming (PBPP) refers to the application of performance management within the parameters of the BIL to achieve desired outcomes for the multimodal transportation system. It is intended to advance transportation investments based on their ability to meet established goals. This includes setting targets for all federally required performance measures.

B. TRANSPORTATION AND TRANSIT PLANNING PERFORMANCE MEASURES

Performance measures are intended to monitor and track performance over time and assess the effectiveness of projects and strategies in meeting the national goal areas. In the Pioneer Valley region, performance-based planning methods have been used in the development of the Transportation Evaluation Criteria to program projects as part of the Regional Transportation Improvement Program for many years.

USDOT implemented the federal PBPP requirements through a series of phased rulemakings. At the conclusion of this rulemaking process, the Commonwealth of Massachusetts has twelve months to establish statewide performance targets for each required federal performance measure. The Pioneer Valley MPO has 180 days from the date of Commonwealth's adoption of the statewide performance targets to either adopt the statewide targets or establish their own regional performance targets.

Table 12-1 - Regional Performance Target Status

Final Rule	Effective Date	Status	Updated
Safety Performance Measures (PM1)	April 14, 2016	MPO adopted state targets on January 24, 2023	Annually
Pavement/Bridge Performance Measures (PM2)	May 20, 2017	MPO adopted state targets on February 28, 2023	Every Two Years
System Performance Measures (PM3)	May 20, 2017	MPO adopted state targets on February 28, 2023	Every Two Years
Transit Asset Management Plan (TAM)	July 26, 2016	MPO adopted PVTA TAM Plan Targets on September 27, 2022	Every Four Years
Public Transportation Agency Safety Plan (PTASP)	November 18, 2020	MPO adopted PVTA PTASP on May 24, 2022	Annually

1. Safety Performance Measures (PM1)

The Pioneer Valley MPO **Error! Bookmark not defined.** has chosen to adopt the statewide safety performance measure targets set by MassDOT for Calendar Year (CY) 2023. 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.

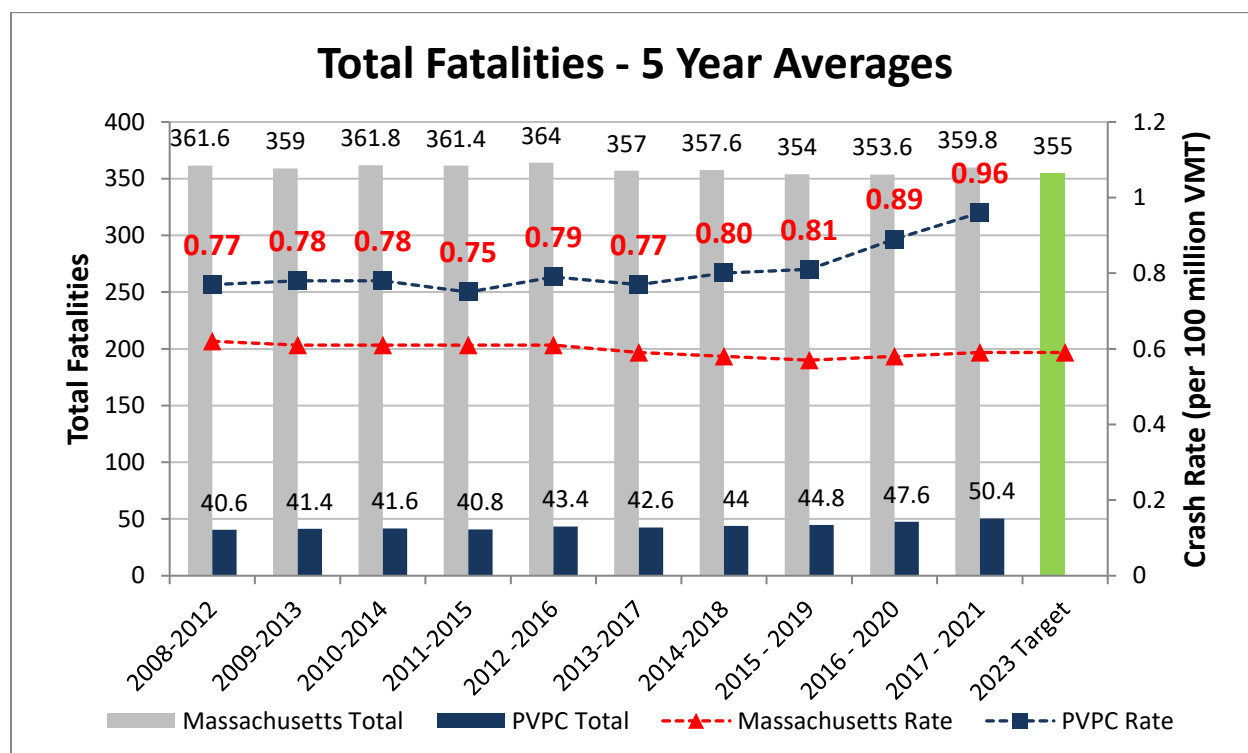
a) Total Fatalities

Per Federal Highway Administration (FHWA) guidance, the calendar year (CY) 2023 target setting process began in April 2022 with a trend line projection based on the most recent available data. Due to higher rates of speeding caused by decreased vehicle miles traveled (VMT) amid pandemic shutdowns in 2020 and the lingering impacts in 2021, 2020 and 2021 fatalities increased relative to previous years. Since the Infrastructure Investment and Jobs Act (IIJA) requires “performance targets to demonstrate constant or improved performance,” MassDOT would be unable to use a pure trendline approach to set CY 2023 targets. Therefore, MassDOT developed targets for CY 2023 by projecting 2022 fatalities to be equal to 3% higher than the state’s lowest year in recent history (2019), and projecting 2023 fatalities to be equal to 3% lower than 2019. This methodology was developed in order to project a future downward trend based on the data available at the time. This analysis resulted in five-year average fatalities decreasing from 360 (2017-2021) to 355 (2019-2023), a reduction of 1.69%. Fatalities are expected to decrease based on MassDOT efforts in the areas of speed management and safe systems, among other safety strategies. As always, MassDOT’s overarching goal is zero deaths and this goal will be pursued by implementing Strategic Highway Safety Plan (SHSP) strategies.

b) Fatality Rate

The fatality rate represents five-year average fatalities divided by five-year average VMTs. The COVID-19 pandemic greatly impacted VMT, causing fatality rates to spike in 2020 with significantly lower VMT and slightly higher fatalities, along with lingering impacts in 2021. The 2023 projection is now 0.59 fatalities per 100 million VMT (five-year average of 2019-2023). The long-term goal is towards zero deaths, so the long-term fatality rate target is 0 fatalities per 100 million VMTs. The fatality rate for the Pioneer Valley MPO has been increasing over the last few years and does not follow the statewide trend line. Specific tasks have been included in the FFY2024 Unified Planning Work Program for the Pioneer Valley MPO to identify potential causes and develop recommendations to reverse this trend.

Figure 12-1 - Performance Targets for Total Fatalities



Note: 2022 data was not complete when targets were set and therefore was not used for target setting purposes.

c) Total Serious Injuries

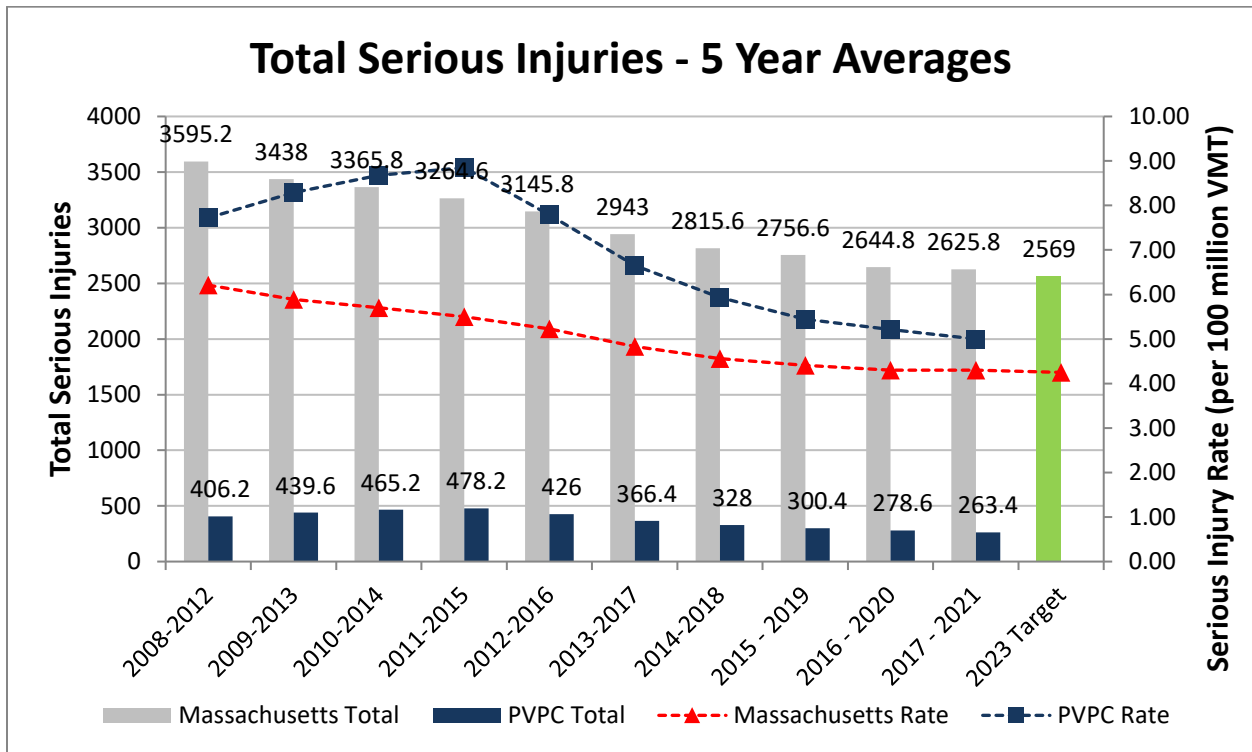
The 2020 – 2022 serious injury data were not finalized in the statewide crash system at the time of target setting, so MassDOT used the information that was available as of April 2022. Due to higher rates of speeding caused by decreased VMT amid pandemic shutdowns in 2020 and the lingering impacts in 2021, 2020 and 2021 serious injuries increased relative to previous years. Therefore, MassDOT developed targets by projecting the 2022 annual serious injuries to be equal to the lowest year in recent history and the 2023 annual serious injuries to continue

downward at a roughly 10% annual decrease, which reflects the average decreases in the years in which the state experienced reductions in serious traffic injuries. This approach resulted in a 5-year average number of serious injuries dropping from 2,626 (2017-2021) to 2,569 (2019-2023), a reduction of 1.99%.

d) Serious Injuries Rate

Similar to the fatality rate, serious injury rates were greatly impacted due to COVID. Following the methods above, the projection is now 4.25 serious injuries per 100 million VMT (2019-2023), down from 4.30 serious injuries per 100 million VMT (2017-2021), a reduction of 1.57%. The long-term goal is towards zero deaths and serious injuries, so the long-term serious injury rate target is 0.0 serious injuries per 100 million VMT. Regional serious injury rates are declining and beginning to converge with the statewide 5 year average.

Figure 12-2 - Performance Targets for Serious Injuries



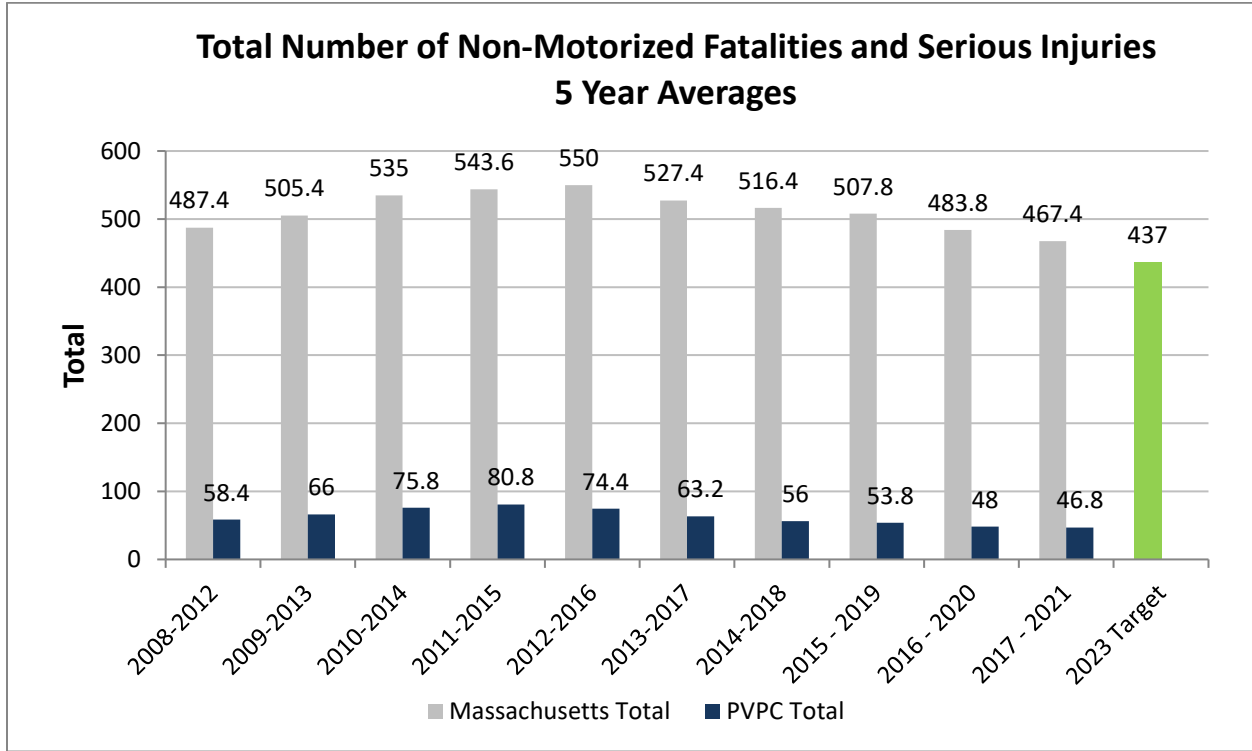
Note: 2022 data was not complete when targets were set and therefore was not used for target setting purposes.

e) Total Number of Non-Motorized Fatalities and Serious Injuries

The number of non-motorist fatalities and serious injuries decreased dramatically during the start of the pandemic in 2020, followed by an increase in 2021 and further movement in the wrong direction to start 2022. This fluctuation made tracking the trend in this area difficult. Therefore, non-motorized fatalities and serious injuries for 2022 were set to be equal to 3% higher than our recent lowest year, and 2023 were set to be 3% lower than the recent lowest year. This results in a 5-year average of

non-motorist fatalities and serious injuries going from 467 (2017-2021) to 437 (2019-2023), a reduction of 6.86%.

Figure 12-3 - Performance Targets for Non-motorized Injuries and Fatalities



Note: 2022 data was not complete when targets were set and therefore was not used for target setting purposes.

The fatality and serious injury data contained here was developed to align with the data included in MassDOT's annual Highway Safety Improvement Program (HSIP) report. As such, historical data may be different from what was reported in prior years.

2. Bridge & Pavement Performance Measures (PM2)

Beginning in 2018, MassDOT was required to adopt statewide targets with MPOs either adopting the statewide target or establishing their own by November of 2018. **Error! Bookmark not defined.** has chosen to adopt the 2-year (2023) and 4-year (2025) statewide bridge and pavement performance measure targets set by MassDOT. 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. Two-year and four-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.

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 trends between 2019 and 2021. 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). These measures and targets are used in conjunction with federal measures to inform program sizing and project selection.

Table 12-2 - Bridge and Pavement Performance Measure Status

Performance Measure	Latest (2021)	2-Year (2024)	4-Year (2026)
Bridges in good Condition	16%	16%	16%
Bridges in poor condition	12%	12%	12%
Interstate Pavement in good condition	72%	70%	70%
Interstate Pavement in poor condition	0	2%	2%
Non-Interstate Pavement in good condition	33.90%	30%	30%
Non-Interstate Pavement in poor condition	2.90%	5%	5%

3. Reliability, Congestion, & Emissions Reduction Measures (PM3)

Error! Bookmark not defined. has chosen to adopt the 2-year (2024) and 4-year (2026) statewide reliability, congestion, and emissions performance measure targets set by MassDOT. MassDOT was required to adopt a statewide target by December 16th, 2022, with MPOs either adopting the statewide target or establishing their own within a 180-day deadline. MassDOT’s 2024 and 2026 targets were proposed considering the uncertainty of 2022 data which was compiled at the end of July of that year.

As mentioned in the title, PM3 measures integrate travel time, congestion, delay, and air pollutants’ emissions reduction criteria. The targets are established along five different measures.

1. Travel Time Reliability (Interstate and Non-Interstate)
2. Truck Travel Time Reliability
3. Peak Hour Excessive Delay (New Measure for Pioneer Valley MPO)

4. Percentage of Non-Single Occupant Vehicle Travel (New Measure for Pioneer Valley MPO)
5. Emissions Reduction

PVMPO an agency whose planning area includes communities in the Springfield Urbanized Area (UZA), and as a signatory to the 2018 Springfield UZA Memorandum of Understanding (Springfield UZA MOU)—has also adopted 2-year (2024) and 4-year (2026) Springfield 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 Springfield UZA.

b) Travel Time Reliability and Truck Travel Time Reliability

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.

The NPMRDS is a monthly archive of average travel times, reported every 5 minutes when data is available, on the National Highway System. The travel times are based on vehicle probe-based data. Separate average travel times are included for “all traffic,” freight and passenger travel. FHWA provides access to the NPMRDS to our State DOT and MPO partners for their performance management activities. Average travel times have been collected monthly since July 2013.

Level of Travel Time Reliability (LOTTR) is measured on both the Interstate System and non-Interstate National Highway System and is based on the amount of time it takes to drive the length of a road segment. The metric is the percentage of person-miles traveled that are ‘reliable’. 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.

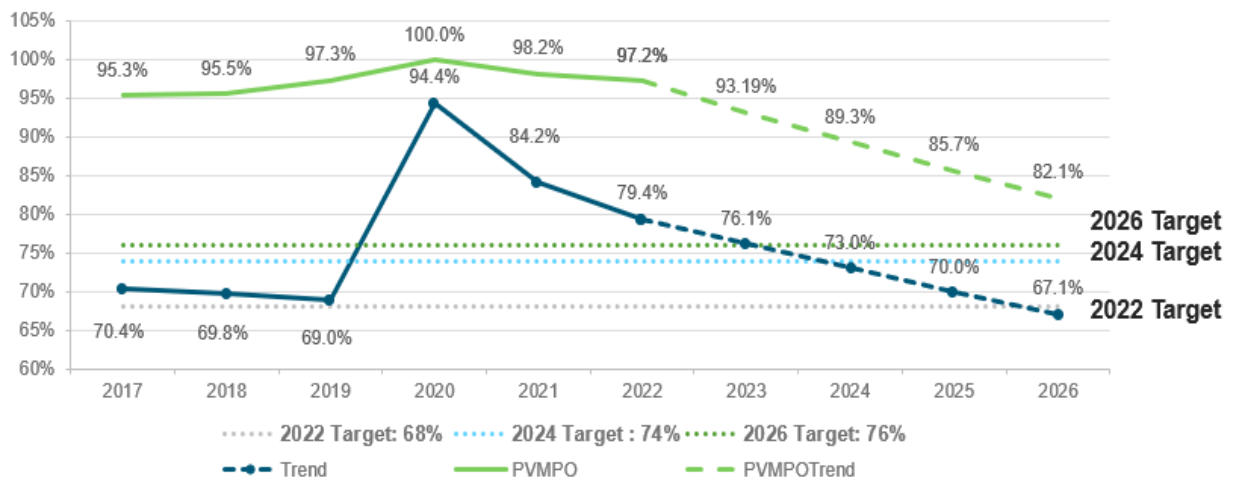
Steps to compute LOTTR:

1. Collect travel times (NPMRDS)
2. Find the 50th pct. and 80th pct. times.
3. Compute $LOTTR = 80^{th}/50^{th}$ percentile
4. Repeat for 4 periods (see figure 12-4)
5. If all are below 1.50, segment is reliable.
6. The statewide metric is the % of person miles traveled that are reliable.

Figure 12-4 - LOTTR Time Periods and a Sample Segment Calculations

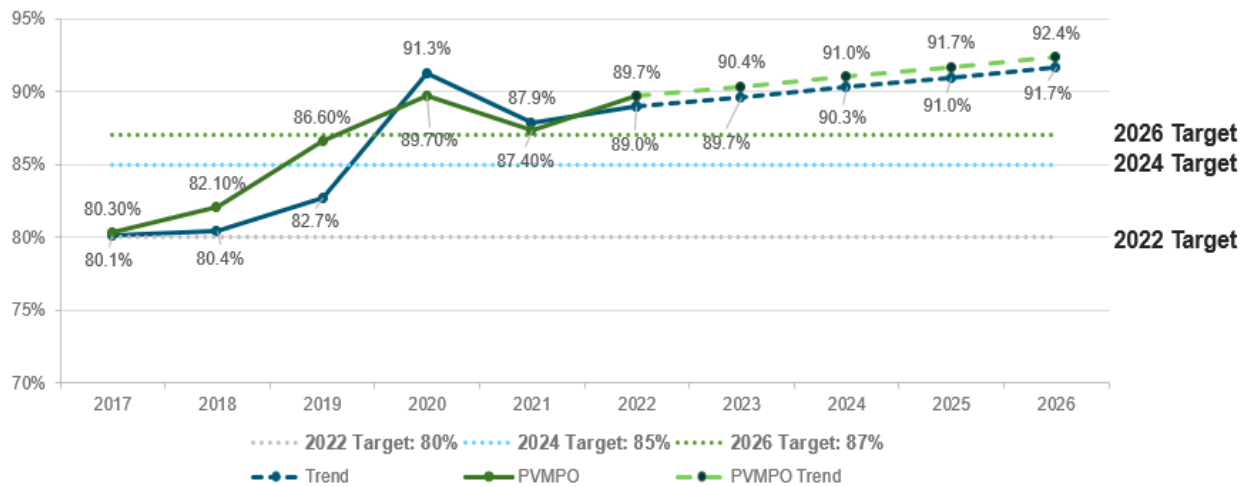
Level of Travel Time Reliability (LOTTR) (Single Segment, Interstate Highway System)		
Monday – Friday	6am – 10am	LOTTR = $\frac{44 \text{ sec}}{35 \text{ sec}} = 1.26$
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = 1.54
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during all of the time periods		Segment is not reliable

Figure 12-5 - Interstate LOTTR Targets



The 2024 target is proposed considering the uncertainty of the 2022 value which was computed in the month of July utilizing year-to-date data. A 2024 target of 74% allows for uncertainty while still being significantly above the 2022 target. A 2026 target of 76% is proposed to establish an improving target. The percentage of reliable regional interstate segments remains above all statewide targets.

Figure 12-6 - Non-Interstate LOTTR Targets



Again, the 2024 target for LOTTR on Non-Interstate roadways is proposed considering the uncertainty of the 2022 value which was computed in the month of July utilizing year-to-date data. A 2024 target of 85% allows for uncertainty while still being significantly above the 2022 target. A 2026 target of 87% is proposed to establish an improving target. Non-Interstate roadways in the Pioneer Valley region remain reliable and generally follow statewide trends.

Truck Travel Time Reliability (TTTR) is the ratio between the 50th percentile travel time and the 95th percentile travel time for trucks only along the Interstate. FHWA’s historical guidance has been to set conservative targets for this measure and to adjust future targets when more data becomes available. To that end, MassDOT’s reliability performance targets are set to remain the same.

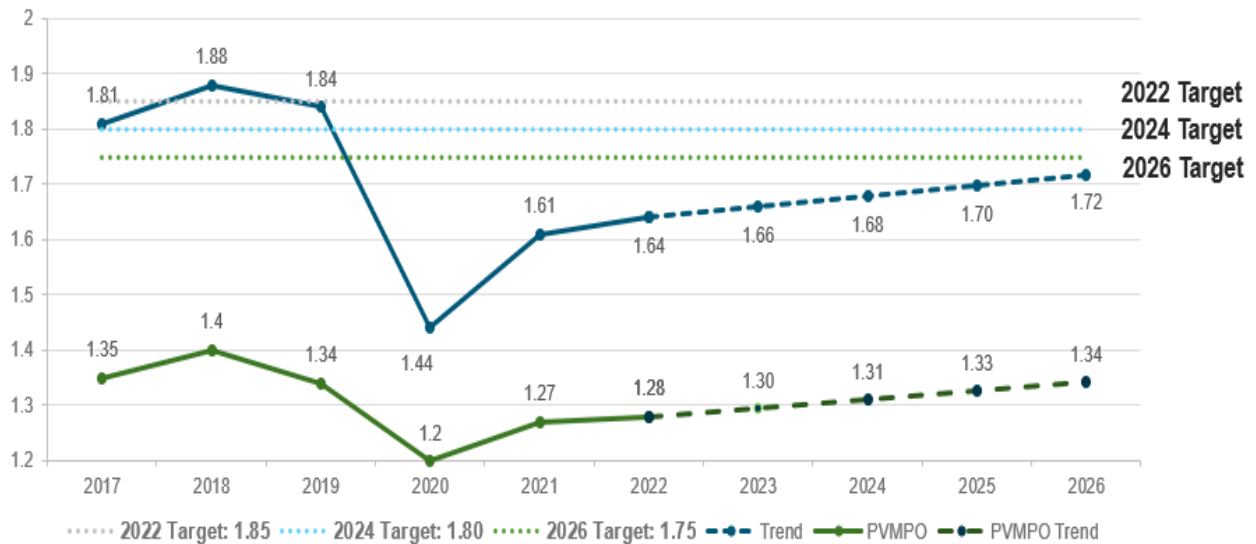
Steps to compute TTTR:

1. Collect travel times (NPMRDS)
2. Find the 50th pct. and 95th pct. times.
3. Compute TTTR = 95th/50th percentile
4. Repeat for 5 periods (see figure on right)
5. The TTTR Index is generated as a weighted average of the largest period for each segment and its weight.

Figure 12-7 - TTTR Time Periods and Sample Segment Calculations

Level of Truck Travel Time Reliability (LOTTR) (Single Segment, Interstate Highway System)		
Monday – Friday	6am – 10am	$TTTR = \frac{55 \text{ sec}}{35 \text{ sec}} = 1.57$
	10am – 4pm	TTTR = 1.25
	4pm – 8pm	TTTR = 2.52
Weekends	6am – 8pm	TTTR = 1.2
All Days	8pm – 6am	TTTR = 1.05

Figure 12-8 - Truck Travel Time Reliability Targets



The 2024 TTTR target is proposed considering the uncertainty of 2022 values which was computed during the month of July utilizing year-to-date data. A 2024 target of 1.8 allows for uncertainty while still being significantly above the 2022 target. A 2026 target of 1.75 is proposed to establish an improving target. TTTR levels in the Pioneer Valley MPO remain comfortably below the established statewide maximum target.

c) Peak Hour Excessive Delay (PHED)

The metric for PHED indicates annual hours of excessive delay per capita on the NHS between 6 am and 10 am, and 3 pm and 7 pm. The threshold for excessive

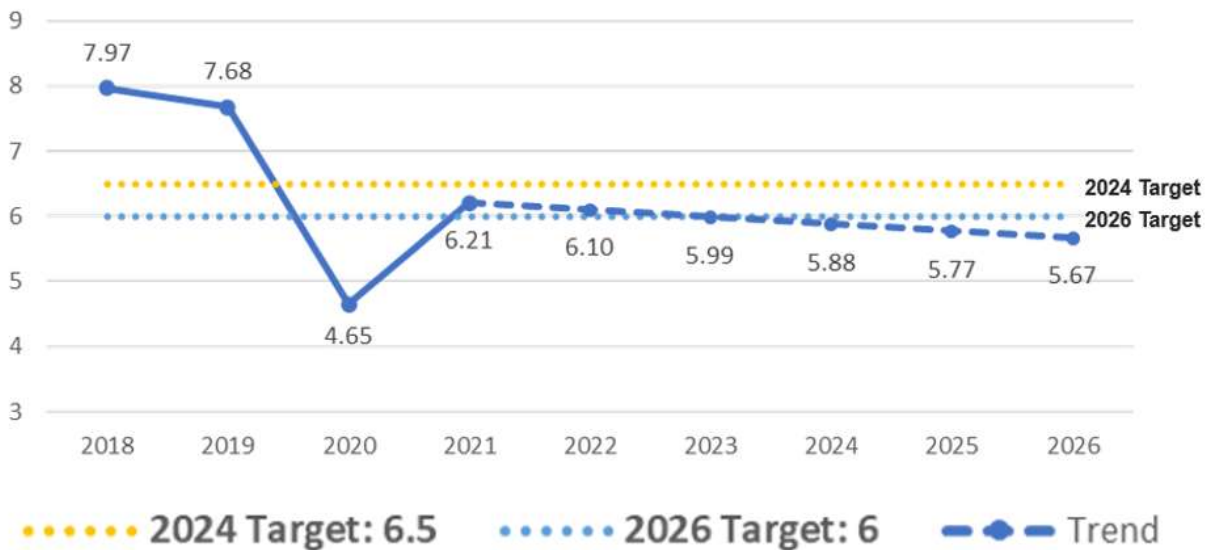
delay is based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater.

Reporting Requirements: Must be reported on the urbanized area (UZA) level for

- the Boston UZA (includes parts of NH and RI)
- Worcester UZA (includes parts of CT)
- Springfield UZA (includes parts of CT)

MassDOT, NHDOT, CTDOT, and the affected MPOs collectively establish a single target for each urbanized area.

Figure 12-9 - Peak Hour Excessive Delay for Springfield Urbanized Area



The targets are proposed considering the uncertainty of the trend post-pandemic. A 2024 target of 6.5 sets a target that accounts for uncertainty. A 2026 target of 6 is proposed to both establish an improving target and one that is below pre-pandemic numbers. MassDOT established these targets in coordination with the Pioneer Valley MPO.

d) Percentage of non-Single Occupant Vehicle (non-SOV) Travel

The metric for non-SOV travel is based on the percentage of people commuting to work using a mode other than a single occupancy vehicle (e.g., carpool, van, public transit, walking, bicycling, or telecommuting).

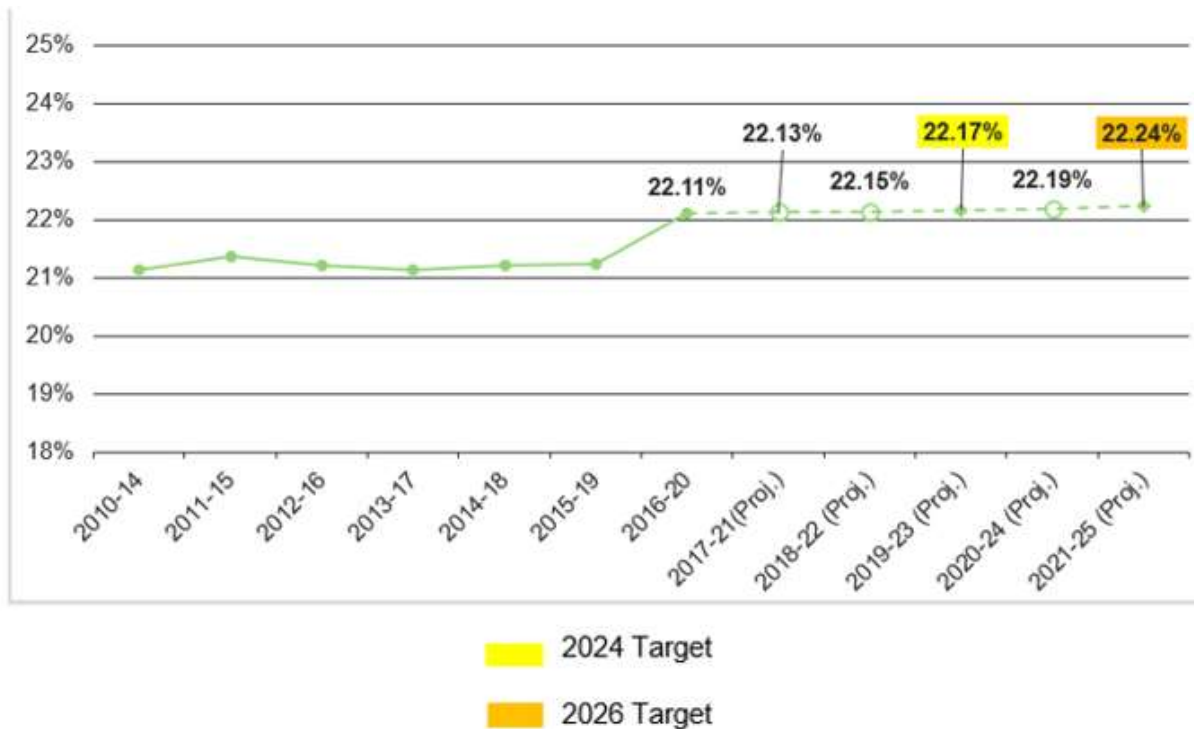
Reporting Requirements: Must be reported on the urbanized area (UZA) level for

- the Boston UZA (includes parts of NH and RI)
- Worcester UZA (includes parts of CT)
- Springfield UZA (includes parts of CT)

MassDOT, NHDOT, CTDOT, and the affected MPOs collectively establish a single target for each urbanized area.

The most updated census data shows that non-SOV travel increased at an average rate of 0.056% between 2010-2014 and 2015-2019. The targets for 2024 and 2026 are derived based on this rate and take into consideration the estimates for the period between 2016-2020 which was disrupted because of the pandemic restrictions. MassDOT established these targets in coordination with the Pioneer Valley MPO.

Figure 12-10 - Percentage of non-SOV Travel in Springfield Urbanized Area



e) Emissions Reduction

These 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 and projects located in these areas that are included as part of the current Transportation Improvement Program.

Table 12-3 - Reliability, Congestion and Emissions Performance Measure Targets

Measure	Current (2021)	2-year (2023)	4-year (2025)
Interstate LOTTR	84.2%	74.0%	76.0%
Non-Interstate LOTTR	87.2%	85.0%	87.0%
TTTR	1.61	1.80	1.75
PHED (Boston UZA)	18.0	24.0	22.0
PHED (Springfield UZA)	6.2	6.5	6.0
PHED (Worcester UZA)	6.8	7.0	5.0
% non-SOV (Boston UZA)	36.9%	38.8%	39.8%
% non-SOV (Springfield UZA)	21.5%	22.2%	22.2%
% non-SOV (Worcester UZA)	23.4%	25.4%	26.1%
Emissions Reductions: PM2.5			
Emissions Reductions: NOx	0.490	0.000	0.000
Emissions Reductions: VOC	0.534	0.000	0.000
Emissions Reductions: PM10			
Emissions Reductions: CO	6.637	0.354	0.354

4. Transit Asset Management Plan (TAM)

The Federal Transit Administration has finalized a rule to define requirements for transit asset management. This rule requires public transportation providers to develop and implement transit asset management (TAM) plans. TAM plans must include an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the state of good repair of capital assets. This rule also establishes a state of good repair standards and four state of good repair performance measures.

Transit Asset Management is defined as a strategic and systematic process through which an organization procures, operates, maintains, rehabilitates, and replaces transit assets to manage their performance, risks, and costs over their lifecycle to provide cost-effective, reliable, and safe service to current and future customers.

As part of the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the subsequent Fixing America’s Surface Transportation (FAST) ACT, the FTA enacted regulations for transit asset management that require transit service providers to establish asset management performance measures and targets and to develop a TAM Plan. This was continued in the BIL. The final TAM rule was published on July 26, 2016, and went into effect on October 1, 2016.

The Pioneer Valley Transit Authority (PVTA) manages a range of assets that include a fleet of heavy-duty transit buses, paratransit vehicles, support vehicles, and nine facilities, plus other capital assets required to support operations across a service territory encompassing 24 communities. PVTA recognizes that an effective approach to asset management incorporates the people, processes, technology, data and information and continual improvement needed to support better management of assets over their entire lifecycle. PVTA has developed their TAM Plan as a roadmap to systematically identify and address assets and asset management practices in need of improvement; establish a benchmark for where their inventory and policies stand; identify gaps in their practice; establish new, measurable key performance indicators and use a data-driven approach to achieve its goals.

PVTA has developed the TAM plan, not as an end, but instead as the beginning of an on-going effort to develop and integrate asset management practices throughout the entire organization. Over the coming years PVTA plans to continue to build upon this foundation and will work to implement successful and effective policies, practices and processes that reinforce and complement the goals and objectives outlined in the TAM plan. PVTA expects the TAM plan to be a living document that is updated annually.

Table 12-4 - PVTA TAM Plan Performance Measures and Targets

Rule	Performance Measure	State Target
TAM	Percent of revenue vehicles by asset class that have met or exceeded their Useful Life Benchmark (ULB)	Articulated Bus = 0%, Bus = 32%, Cutaway Bus = 39
TAM	Percent of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Automobiles = 100% Trucks and other Rubber Tire Vehicles = 27%
TAM	Percent of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administrative and Maintenance = 0% Passenger and Parking = 0%

5. Public Transportation Agency Safety Plans (PTASP)

Public Transportation Agency Safety Plans (PTASP) were authorized by the MAP–21 legislation and continued as part of the BIL. Under this rule, operators of public transportation systems that receive Federal financial assistance under 49 U.S.C. Chapter 53 such as the PVRTA, must develop and implement a PTASP to help ensure that public transportation systems are safe nationwide. The PTASP must include four main elements: (1) Safety Management Policy, (2) Safety Risk Management, (3) Safety Assurance, and (4) Safety Promotion. PVRTA’s Safety Committee voted to adopt their FFY2023 Safety Targets in November of 2022:

Table 12-5 - PVRTA PTASP Performance Measures and Targets

Performance Measure	Target
Fatalities	0
Incapacitating Injuries	0
Miles Between Breakdowns: Fixed Route	19,500
Miles Between Breakdowns: Paratransit	34,500
Preventable Accidents/100,000 miles: Fixed Route	1.5
Preventable Accidents/100,000 miles: Paratransit	0.7

These targets were set after examining the five-year rolling averages for each category as well as the prior year goal attainment. Operator input was solicited at the Safety Committee with input received from both front-line employees and management, as well as directly from each operator. Factors such as changing operating environment, pandemic impacts and anticipated construction activity were all considered in setting these targets.

The Bipartisan Infrastructure Law also mandates that the Safety Committee establish targets for risk reduction in three specific areas, reduction of vehicular and pedestrian accidents, and mitigation of assaults on transit workers. However, The Committee is awaiting additional guidance from FTA. Once the National Public Transportation Safety Plan is updated, that will provide guidance on how these targets should be defined, then the Committee will define those targets further and incorporate them into the PTASP.

C. SUMMARY OF PERFORMANCE BASED TARGETS

As discussed above, the Pioneer Valley MPO has elected to adopt the State performance targets for PM1, PM2 and PM3. The MPO will continue to work in close collaboration with the PVRTA to incorporate their TAM and PTASP performance targets into the regional transportation planning process. Table 12-6 summarizes all the information regarding these performance measures and targets. The UPWP includes specific tasks to support the performance-based planning and programming for the Pioneer Valley MPO.

Table 12-6 - Performance Targets for the Pioneer Valley MPO

Rule	Performance Measure	Target
PM1	Total Number of Fatalities	Reduce the Total Number of Fatalities to 355 or less statewide with an overarching goal of zero fatalities.
PM1	Rate of Fatalities per 100 Million Vehicle Miles Traveled (VMT)	Reduce the Rate of Fatalities to 0.59/100 million VMT or less statewide with an overarching goal of zero fatalities/100 million VMT.
PM1	Total Number of Serious Injuries	Reduce the Total Number of Serious Injuries to 2569 or less statewide.
PM1	Rate of Serious Injuries per 100 Million VMT	Reduce the Rate of Serious Injuries to 4.25/100 million VMT or less statewide.
PM1	Total Number of Non-Motorized Fatalities and Serious Injuries	Do not exceed 437 for the Total Number of Non-Motorized Fatalities and Serious Injuries statewide with an overarching goal of zero fatalities.
PM2	Percentage of pavement of the Interstate System in Good condition	Maintain a condition of 70% or better for 2023 and 2025
PM2	Percentage of pavement of the Interstate System in Poor condition	Maintain a condition of 2% or less for 2023 and 2025
PM2	Percentage of pavement of the non-Interstate NHS in Good condition	Maintain a condition of 30% or better for 2023 and 2025
PM2	Percentage of pavement of the non-Interstate NHS in Poor condition	Maintain a condition of 5% or less for 2023 and 2025
PM2	Percentage of NHS bridges classified in Good condition	Maintain a condition of 16% or better for 2023 and 2025
PM2	Percentage of NHS bridges classified in Poor condition	Maintain a condition of 12% or less for 2023 and 2025
PM3	Level of Travel Time Reliability (LOTTR) on the Interstate System	Maintain a LOTTR at or above 74% statewide for the Interstate System in 2023 and above 76% for 2025
PM3	Level of Travel Time Reliability (LOTTR) on non-Interstate NHS	Maintain a LOTTR at or above 85% statewide for the non-Interstate NHS in 2023 and above 87% in 2025
PM3	Level of Truck Travel Time Reliability (TTTR)	Maintain a TTTR of 1.80 or better statewide for the Interstate System in 2023 and 1.75 or better in 2025
PM3	Peak Hour Excessive Delay (annual hours per capita)	Do not exceed 6.5 annual hours per capita in the Springfield Urbanized Area for 2023 and 6 annual hours in 2025
PM3	Percentage of Non-Single Occupant Vehicle (SOV) Travel	Maintain at least 22.17% for Non-SOV Travel in the Springfield Urbanized Area for 2023 and 22.24% for Non-SOV Travel in 2025
PM3	On-road mobile source emissions from projects funded under the Congestion Mitigation and Air Quality Program (CMAQ) for City of Springfield	Currently no CMAQ projects programmed in the City of Springfield.
TAM	Percent of revenue vehicles by asset class that have met or exceeded their Useful Life Benchmark (ULB)	Articulated Bus = 0%, Bus = 32%, Cutaway Bus = 39%,
TAM	Percent of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Automobiles = 100% Trucks and other Rubber Tire Vehicles = 27%
TAM	Percent of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administrative and Maintenance = 0% Passenger and Parking = 0%
PTASP	Total Number of Fatalities	Target of 0 Fatalities
PTASP	Total Number of Serious Injuries	Target of 0 Serious injuries
PTASP	Fixed Route miles between breakdowns	Target of 19,500 miles
PTASP	Paratransit miles between breakdowns	Target of 34,500 miles
PTASP	Fixed Route preventable accidents/100,000 miles	Target of 1.5
PTASP	Paratransit preventable accidents/100,000 miles	Target of 0.7

D. PERFORMANCE BASED FUNDING ALLOCATIONS FOR TRANSPORTATION AND TRANSIT IMPROVEMENT PROJECTS

1. Highway Improvement Projects

As can be seen in Table 12-7, the PVMPO anticipates investing \$171.6 million over the next 5 years on projects that will aid the PVMPO in meeting the Performance Measure targets. The PVPC staff used project information to identify the percentage of each project that contributes to each of the performance measures (PM1, PM2 and PM3).

Of these investments 22% (\$37,951,854) will help achieve PM1, 58% (\$99,301,854) will help achieve PM2, and 20% (\$34,293,111) will help achieve PM3. As more data becomes available it is anticipated that corresponding PM trends should be seen showing that our region is meeting or exceeding our PM Rules.

Table 12-7 - Performance Measures Based Allocations for Highway Improvement

TIP Year	Municipality	Project Description	Total Programmed	PM 1	PM 2	PM 3
2024	Wales	Wales- Reconstruction & Improvements On Monson Road, From The Monson T.L. To Reed Hill Road (1.5 Miles)	\$5,438,563	5%	85%	10%
2024	Springfield	Springfield- Reconstruction Of Sumner Avenue At Dickinson Street And Belmont Avenue (The "X")	\$12,966,867	35%	30%	35%
2024	Worthington	Worthington- Reconstruction & Related Work On Route 143 (Phase Ii), From Peru T.L. To Cold Street	\$13,516,605	15%	85%	0%
2025	Longmeadow	Longmeadow- Springfield- Resurfacing And Intersection Improvements On Longmeadow Street (Route 5) And Converse Street (0.84 Miles)	\$9,560,118	30%	35%	35%
2025	Holyoke	Holyoke- Resurfacing And Related Work On Cabot Street And Race Street (Center City Connector)	\$5,713,101	5%	80%	15%
2025	Northampton	Northampton- Downtown Complete Streets Corridor And Intersection Improvements On Main Street (Route 9)	\$15,473,207	33%	33%	34%
2025	Multiple	Valley Bike Share Expansion (Phase 3)	\$1,458,684	0%	0%	100%
2026	Williamsburg	Williamsburg- Reconstruction Of Mountain Street	\$11,907,596	5%	95%	0%
2026	South Hadley	South Hadley- Reconstruction Of Main Street From The Chicopee City Line To Canal Street (0.67 Miles)	\$5,867,459	20%	45%	35%
2026	Chicopee	Chicopee- Intersection Improvements At Montgomery Street, Granby Road, And Mckinstry Avenue	\$9,556,807	40%		60%
2026	Northampton	Northampton- Downtown Complete Streets Corridor And Intersection Improvements On Main Street (Route 9)	\$4,188,494	33%	33%	34%
2027	Williamsburg	Williamsburg- Reconstruction Of Mountain Street	\$2,200,000	5%	95%	0%
2027	Chesterfield	Chesterfield- Reconstruction Of North Road And Damon Pond Road	\$6,638,146	5%	95%	0%
2027	Easthampton	Easthampton- Downtown Complete Streets Improvements On Main And Northampton Streets (Route 10)	\$15,621,659	33%	33%	34%
2027	East Longmeadow	East Longmeadow- Resurfacing And Related Work On North Main Street (Route 83)	\$9,697,240	15%	80%	5%
2027	Westfield	Westfield- Intersection Improvements At Southampton Road (Route 10/202), Servistar Industrial Way And Barnes Airport Drive	\$4,872,000	35%	10%	55%
2028	Easthampton	Easthampton- Improvements And Related Work On Route 10, From West Street To The Northampton Town Line	\$6,680,150	35%	65%	0%
2028	Longmeadow	Longmeadow- Resurfacing And Related Work On Longmeadow Street (Route 5) (Phase 1)	\$13,227,660	15%	80%	5%
2028	Southampton	Southampton- Rehabilitation/Reconstruction & Related Work On East Street, From College Highway (Route 10) To Whispering Meadow Lane	\$10,849,212	20%	80%	0%
2028	Monson	Monson- Resurfacing And Related Work On Main Street (Route 32)	\$6,517,415	10%	90%	0%
Total Investment by Performance Measure (23 Projects)			\$171,950,983			

2. Transit Improvement Projects

Table 12-8 depicts PVTA’s planned capital investments over the next five years. These funds will help our region meet the TAM objectives. PVTA anticipates spending \$98.8 million on buses, vans, minibuses, and facility maintenance. Approximately 73% of PVTA’s yearly capital budget is allocated to fleet replacement in alignment with TAM guidelines.

PTASP targets were approved by the MPO in 2022, projects will be evaluated as more data becomes available to measure PTASP effectiveness.

Table 12-8 - Performance Measures Based Allocations for Transit Improvements

TIP Year	Municipality	Description	Cost
2024		Pioneer Valley Transit Authority - Paratransit Vans -10-14 Passenger	\$182,027
2024	Northampton	Pioneer Valley Transit Authority - Rehab/Renovate - Northampton Bus Maintenance Facility Expansion And Ev Depot Charging Design Study	\$120,000
2024		Pioneer Valley Transit Authority - Buy Replacement 40-Ft Hybrid Bus	\$9,598,002
2024		Pioneer Valley Transit Authority - Replacement 35' Hybrid Bus (4) - Includes \$155,016 Cares	\$3,031,316
2024	Amherst	Pioneer Valley Transit Authority - Umass Bus Maintenance Facility - Upgrade Bus Bay Lateral Expansion	\$4,500,000
2024		Pioneer Valley Transit Authority - Buy Replacement <30 Ft Bus Type D Shuttle Bus	\$343,116
2024	Holyoke	Pioneer Valley Transit Authority - Rehab/Renovate - Holyoke Itc Bus Bay, Canopy And Pavement Upgrades	\$250,000
2024	Springfield	Pioneer Valley Transit Authority - Springfield O&M Bus Maintenance Facility Site Access Control Improvements	\$360,000
2024	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Springfield O&M Facility At Cottage St. Electric Bus Chargers Expansion And Upgrades	\$10,729,448
2024	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Admin/Maint Facility Cottage St Electric Replacement Of Oveehed Door System	\$80,000
2024		Pioneer Valley Transit Authority - Acquire - Supervisory Vehicles	\$471,726
2025		Pioneer Valley Transit Authority - Paratransit Vans -10-14 Passenger	\$1,562,396
2025		Pioneer Valley Transit Authority - Buy Replacement 40-Ft Hybrid Bus	\$11,881,240
2025	Amherst	Pioneer Valley Transit Authority - Umass Bus Maintenance Facility - Upgrade Bus Bay Lateral Expansion	\$6,200,000
2025		Pioneer Valley Transit Authority - Buy Replacement <30 Ft Bus Type D Shuttle Bus	\$537,000
2025	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Administrative Facility Main Street Masonry Repairs To Buildings Envelope	\$480,000
2025		Pioneer Valley Transit Authority - Acquire - Support	\$86,000

TIP Year	Municipality	Description	Cost
2025	Northampton	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Northampton Ev Bus Charging Stations Installations	\$750,000
2025	Holyoke	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Umass Bus O&M Facility Installation Of Ev Bus Charging Stations	\$750,000
2025		Pioneer Valley Transit Authority - Buy Repl 60 Ft Articulated Bus	\$2,728,406
2025		Pioneer Valley Transit Authority Buy Replacement 40-Ft Electric Bus	\$2,273,572
2025		Pioneer Valley Transit Authority - Buy Replacement 35-Ft Electric Bus	\$2,273,572
2025	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Springfield O&M Facility At Cottage St. Electric Bus Chargers Expansion And Upgrades	\$650,000
2026		Pioneer Valley Transit Authority - Paratransit Vans -10-14 Passenger	\$218,854
2026		Pioneer Valley Transit Authority - Rehab Northampton Maintenance Facility, Year 3, 4 And 5	\$540,000
2026	Amherst	Pioneer Valley Transit Authority - Umass Bus Maintenance Facility - Upgrade Bus Bay Lateral Expansion	\$200,000
2026		Pioneer Valley Transit Authority - Buy Replacement <30 Ft Bus Type D Shuttle Bus	\$364,012
2026	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Administrative Facility Main Street Masonry Repairs To Buildings Envelope	\$480,000
2026		Pioneer Valley Transit Authority Buy Replacement 40-Ft Electric Bus	\$12,556,041
2026	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Admin/Maint Facility - Main St O&M Roof	\$600,000
2027		Pioneer Valley Transit Authority - Paratransit Vans -10-14 Passenger	\$1,740,423
2027		Pioneer Valley Transit Authority - Rehab Northampton Maintenance Facility, Year 3, 4 And 5	\$2,600,000
2027	Amherst	Pioneer Valley Transit Authority - Umass Bus Maintenance Facility - Upgrade Bus Bay Lateral Expansion	\$200,000
2027		Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Main St O&M Renovate Office	\$1,400,000
2027	Amherst	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Umass Bus Facility - Ac Maintenance And Restroom Upgrades	\$790,000
2027		Pioneer Valley Transit Authority - Buy Repl 60 Ft Articulated Bus	\$600,000
2027		Pioneer Valley Transit Authority Buy Replacement 40-Ft Electric Bus	\$2,397,062
2027		Pioneer Valley Transit Authority - Buy Replacement 35-Ft Electric Bus	\$1,430,748
2027	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Springfield O&M Facility At Cottage St. Electric Bus Chargers Expansion And Upgrades	\$606,178
2027	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Admin/Maint Facility Main St Paratransit O&M - Lower Level Renovation Of Maintenance Building	\$450,000

TIP Year	Municipality	Description	Cost
2028		Pioneer Valley Transit Authority - Paratransit Vans -10-14 Passenger	\$341,454
2028		Pioneer Valley Transit Authority - Replacement 35' Hybrid Bus (4) - Includes \$155,016 Cares	\$2,812,794
2028		Pioneer Valley Transit Authority - Rehab Northampton Maintenance Facility, Year 3, 4 And 5	\$122,000
2028		Pioneer Valley Transit Authority - Buy Replacement <30 Ft Bus Type D Shuttle Bus	\$193,090
2028		Pioneer Valley Transit Authority Buy Replacement 40-Ft Electric Bus	\$29,887,681
2028		Pioneer Valley Transit Authority - Buy Replacement 35-Ft Electric Bus	\$11,885,771
2028	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Maintenance Facility - Springfield O&M Facility At Cottage St. Electric Bus Chargers Expansion And Upgrades	\$292,270
2028	Springfield	Pioneer Valley Transit Authority - Rehab/Renovate - Admin/Maint Facility Main St Paratransit O&M - Lower Level Renovation Of Maintenance Building	\$3,570,000

E. SYSTEM PERFORMANCE REPORT

The System Performance Report methodology and targets developed for the 2020 Regional Transportation Plan were updated based on consultation with the JTC and MPO. Each performance target was assessed on an evaluation score of excellent, good, or needs improvement.

For some targets, the assessment was not possible due to the drastic impact of the pandemic related disruptions or due to revised data collection methods which made it difficult to compare the historic data with the latest data because of differences in analyses techniques and metrics.

The definitions of the evaluation scores are summarized below:

- **Excellent** – The performance measure currently meets or exceeds its performance target.
- **Good** – The performance measure is on track to meet its performance target by the established deadline.
- **Needs Improvement** – The performance measure is not on track to meet its performance target by the established deadline.
- **Assessment will be possible in future** – More data is needed to assess the performance measure.

1. Overall Condition Index

Performance Target = Increase the OCI by 5% from 2019 levels by 2030.

The PVPC has updated the pavement management system since the development of 2020 RTP. More time is needed to understand how the 2023 OCI of 59.3 compares to the OCI calculated during previous years.

- RTP Assessment: **Assessment will be possible in future**

2. Motor Vehicle Fatalities

Performance Target = Meet adopted Statewide PM1 Safety Targets with an overarching goal of 0 Fatalities

Table 12-9 - Fatal Crashes in the Pioneer Valley

RTP 2016 Table

2008	2009	2010	2011	2012
35	41	37	34	44

RTP 2020 Update

2013	2014	2015	2016	2017
42	43	36	51	41

RTP 2024

2018	2019	2020	2021	2022
48	48	50	64	67

Source: MassDOT Crash Portal

The number of fatalities in the region has increased in the last five-year period. This trend is observed throughout the State. The new Strategic Highway Safety Plan developed by the State aims to address this issue throughout the State. The Pioneer Valley MPO included specific safety tasks as part of the FFY2024 Unified Planning Work Program to identify potential causes for these increases and develop recommendations to reverse this trend.

- RTP Assessment: **Needs Improvement**

3. Roadway Fatalities and Serious Injuries

Performance Target = Meet adopted Statewide PM1 Safety Targets with an overarching goal of 0 Fatalities.

Table 12-10 - Fatal and Serious Injury Crashes in the Pioneer Valley

RTP 2016 Table

2008	2009	2010	2011	2012	5-Yr Avg.
277	249	269	514	486	359

RTP 2020 Update

2013	2014	2015	2016	2017	5-Yr Avg.
408	362	333	356	264	345

RTP 2024

2018	2019	2020	2021	2022	5-Yr Avg.
260	259	250	314	333	235

Source: MassDOT Crash Portal

The total number of fatal and serious injury crashes for the last five years has decreased by more than 18% since the development of RTP 2020. This is encouraging despite the recent increase in crashes in 2021 and 2022.

- RTP Assessment: **Good**

4. Safety Studies

Performance Target = Complete at least one safety study per year as part of the UPWP.

Table 12-11 - Safety Studies Completed Over the Past 7 Years

2012	2017	2018	2019	2020	2021	2022
4	2	2	2	2	2	2

Source: PVPC

Currently, the region is exceeding the target to complete at least one safety study per year as part of the UPWP.

- RTP Assessment: **Excellent**

5. Structurally Deficient Bridges

Performance Target = Reduce the number of structurally deficient bridges below 2014 levels.

Table 12-12 - Structurally Deficient Bridges in the Pioneer Valley Since 2009

	2009	2010	2011	2012	2014	2018	2023
Structurally Deficient Bridges	75	69	63	65	53	50	61
Total Bridges	674	674	669	676	678	685	688

Source: MassDOT Bridge Database

The percentage of structurally deficient bridges in the region has increased from 2014 levels. There was a drop in 2018, however an increase from 7.2% to 8.9% was observed within the last five years.

- RTP Assessment: **Needs Improvement**

6. Closed, Weight Restricted, and Height Restricted Bridges/Underpasses

Performance Target = Maintain a downward trend in regional restricted bridge totals.

The significant reduction observed in the number of bridges with vertical clearance restrictions was because of the improvement in the quality of available data. The latest analysis includes all MassDOT bridges and railroad bridge underpasses with vertical clearances lower than 14 and a half ft. With increased confidence in the available data, it will be possible to monitor these locations and plan better to improve this performance measure.

Table 12-13 - Restricted and Closed Bridges/Underpasses

	2011	2014	2018	2023
Weight Restricted Bridges	92	63	78	82
Bridges with Vertical Clearance Restrictions (Under 14.5 ft)	73	65	110	60
Closed Bridges	14	13	6	4

Source: MassDOT Bridge Database, PVPC Regional Freight Plan Inventory of Low-Clearance Railroad Underpasses

The number of closed bridges declined along with the number of bridges/underpasses with vertical clearance restrictions. There was a marginal increase in the number of bridges with weight restrictions, however the overall reduction in the total number of restricted locations coincides with the objectives outlined by the region for this performance measure.

- RTP Assessment: **Good**

7. Average Driver Delay along 'Unreliable' Roadway Segments

Performance Target = Reduce the number of “unreliable” roadway segments by 5% from 2022 to 2030

Table 12-14 - The Number of Unreliable Segments by CMP Analysis Year

2019	2020	2021	2022
525	469	267	207

Source: PVPC using RITIS data

In 2019 PVPC began using [Regional Integrated Transportation Information System \(RITIS\)](#) probe data analytics suite to conduct all congestion related planning tasks. The probe data analytics suite offers several tools to perform congestion analysis. Staff can now easily access raw travel time data for all major routes in the region. The data can be exported for additional analysis. Staff use this raw data to calculate the Level of Travel Time Reliability (LOTTR) for all segments in the region. For this measure staff calculated the number of “unreliable” segments for each of the past 4 years. For additional information on the LOTTR please refer to Chapter 8.

RITIS continually updates metadata to ensure accuracy within the reporting functions within the probe data analytics suite. This appears to have resulted in some inconsistencies with the long-range analysis performed for the RTP. As a result, we are showing the 2019 and 2022 data for informational purposes, we do not feel that congestion has reduced significantly over the past 4 years. Staff will monitor the number of “unreliable segments over the next 4 years to evaluate this performance target in the next RTP.

- RTP Assessment: **Assessment will be possible in future**

8. Congestion Improvement Projects

Performance Target = Fund at least one congestion improvement project through the TIP every 5 years.

Table 12-15 - Completed Congestion Improvement Projects

2016	2017	2018	2019	2020	2021	2022	2023
1	1	3	1	2	1	1	1

Source: PVPC

Historically, the Pioneer Valley region has completed at least one congestion improvement project through the TIP over the last 8 years.

- RTP Assessment: **Excellent**

9. Congestion-Related Planning Studies

Performance Target = Complete one planning study to reduce congestion per year as part of the UPWP.

Table 12-16 - Completed Congestion Planning Studies

2016	2017	2018	2019	2020	2021	2022
1	1	1	2	1	1	2

Source: PVPC

PVPC has consistently conducted at least one study per year that addresses congestion and/or safety improvement at different locations within the region.

- RTP Assessment: **Excellent**

10. Bicycle Facility Mileage

Performance Target = Increase total regional bike facility mileage by 10% by 2030 over 2020 mileage

Table 12-17 - On-road Bicycle Facility Mileage in the Pioneer Valley

2000	2005	2010	2015	2019	2020
4.50	7.25	8.95	17.95	43.12	123

Source: MassDOT Municipal Dashboard, MassDOT Bicycle Inventory 2020

<https://gis.massdot.state.ma.us/DataViewers/MunicipalDashboard/mainView.html?town=Somerville&dash=Multimodal>

The region has exceeded expectations and has already increased the regional bicycle facility mileage by more than three times the value in 2019.

- RTP Assessment: **Excellent**

11. Regional Shared Use Path Usage

Performance Target = Demonstrate an overall increase in the use of regional bike paths

Table 12-18 - Average Annual Daily Traffic Along Shared Use Paths in the Region

Shared Use Path	2013	2014	2016	2017	2018	2019	2020	2021	2022
CT Riverwalk, Springfield	106	135	X	X	X	X	103	137	67
Redstone, E. Longmeadow	X	X	X	X	293	363	505	490	X
Norwottuck Trail, Hadley	X	X	519	608	571	768	979	762	831
Columbia Greenway, Westfield	X	X	X	X	334	391	677	366	365
Mass Central, Leeds	X	X	X	X	178	176	269	176	143

Use of the Region’s shared-use-paths has steadily increased over the period that data has been collected. This trend has been consistent for most shared-use-paths in the region with a significant increase during the COVID-19 pandemic in 2020. Overall, the represented trails have averaged a nine percent annual increase in ADT since data was first available.

PVPC has partnered with local trails advocacy organizations and MassDOT to expand the data collection program and is working toward collecting data for all facilities in the Pioneer Valley region.

- RTP Assessment: **Excellent**

12. Sidewalk Infrastructure

Performance Target = Increase total regional sidewalk mileage by 10% by 2030 over 2018 mileage.

Table 12-19 - Total Sidewalk Mileage in the Region

	2018
Any roadway mileage with at least one side with sidewalks	1043 miles

Source: MassDOT Road Inventory 2018 (Official statewide road centerline mileage), MassDOT Multimodal dashboard <https://gis.massdot.state.ma.us/DataViewers/MunicipalDashboard/mainView.html?town=Springfield&dash=Multimodal>

Updated sidewalk mileage data is not available currently. Therefore, it is not possible to assess this performance measure as of now.

- RTP Assessment: **Assessment will be possible in future**

13. Average Park and Ride Lot Use

Performance Target = Increase use by 5% over 2019 average occupancy by 2030

Table 12-20 - Average Park and Ride Lot Occupancy

2015	2016	2017	2018	2019	2020	2021	2022
76.5	42.5	42.7	38	130	100	65	72

Source: PVPC

The Park and Ride lots usage has been declining in the region. Rideshare is not a popular option for the inhabitants of the region and the increased popularity of Lyft and Uber may also decrease use of Park and Ride lots.

- RTP Assessment: **Needs Improvement**

14. PVTA and FRTA Ridership

Performance Target = Demonstrate an overall annual increase in PVTA and FRTA ridership.

Table 12-21 - PVTA and FRTA Total Annual Ridership

	2018	2019	2020	2021	2022
PVTA	10,902,207	10,120,344	8,131,759	3,885,177	6,077,602

Source: PVPC

Ridership is provided by fiscal year, thus the impact of the pandemic related disruptions in 2020 is seen in data for FY21 (FY20 only included 3 months of service: April, May, and June 2020). Ridership dropped to its lowest during this time but has been steadily recovering since then. The worst losses were reported on UMass-area routes due to remote classes, and these have been largely resolved since September 2021 (early FY22).

- RTP Assessment: **Assessment will be possible in future**

15. Transit Passengers per Trip and Passengers per Revenue Hour

Performance Target = Maintain consistency with PVTA Tiers of Service

PVTA’s route performance standards were updated in mid-2019 (effective FY20 and onwards) to fix some inconsistencies in classification and a serious flaw in metrics (some routes had been evaluated in terms of passengers per trip instead of per hour, which was an issue because trip lengths vary enormously from route to route, making comparisons impossible). The performance standards since 2019 have focused on passengers per hour, with higher targets required for routes that run more frequent service (that is, routes which require more hours are held to higher standards).

Table 12-22 - Passengers per Trip and Passengers per Revenue Hour Standards

	2019	2020	2021	2022
Routes that meet or exceed standards	15	34	8	18
Total PVTA Routes	41	44	39	41

Source: PVPC

The number of routes that meet the PVTA’s performance standards has increased in 2022 from 2019, however decreased from 2020. The 2020 and 2021 numbers are inconsistent because the operations were heavily impacted by the pandemic restrictions.

- RTP Assessment: **Assessment will be possible in future**

16. Transportation Sector Green House Gas Emissions

Performance Target = Adopt transportation sector GHG sub limits from June 2022 EEA Determination Letter. Emissions limit of 18% below 1990 levels by 2025, 34% below 1990 levels by 2030.

The Global Warming Solutions Act (GWSA) required the Secretary of Energy and Environmental Affairs (EEA) to establish a statewide GHG emissions limit for 2020 and issue a plan for achieving those reductions while growing the clean energy economy. A limit was established of 25 percent below the 1990 level as the emissions limit for 2020. Massachusetts has fully complied with the statewide GHG emissions limit of 25 percent below 1990 level by achieving emissions levels at least 31.4 percent below 1990 levels, based on best available data and measurements⁹.

In March 2021, An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy was signed into law. This law amended the GWSA, codifying the commitment to achieve net zero emissions in 2050 and requiring emissions reductions of at least 33% below the 1990 level for 2025 and at least 50% below the 1990 level for 2030¹⁰.

Table 12-23 - Statewide GHG Emissions Reduction

	2020	2025	2030
Target	25% Reduction from 1990	33% Reduction from 1990	50% Reduction from 1990
Actual Reduction	31.4%	To Be Determined	To Be Determined

Source: MassDOT

The greenhouse gas emissions reduction requirements for 2020 have been met.

- RTP Assessment: **Excellent**

⁹ <https://www.mass.gov/doc/statement-of-compliance-with-2020-greenhouse-gas-emissions-limit/download>

¹⁰ <https://www.mass.gov/doc/determination-letter-for-the-2050-cecp/download>

17. Air Quality Improvement Projects

Performance Target = Fund at least one air quality improvement project through the TIP each year.

Table 12-24 - Air Quality Improvement Projects Completed Over the Past 5 Years

2015	2016	2017	2018	2019	2020	2021	2022	2023
3	1	0	2	1	2	0	0	1

Source: PVPC

The region has been successful in achieving a project per year target for the majority of the TIP years assessed.

- RTP Assessment: **Good**

F. OVERALL SYSTEM PERFORMANCE ASSESSMENT

Based on the results of the system performance report, a total of 9 (Excellent and Good Scores) out of the 17 regional performance targets are either currently met or are on track to be met by established deadlines. This finding is consistent with the results of the previous RTP report. The scores are summarized in Table 12-25.

A total of 5 performance measures require additional data collection in the future to determine whether or not the trend is progressing towards achieving the established goals.

Table 12-25 - Summary of System Performance Assessment

Excellent	Good	Needs Improvement	Future Assessment
6	3	3	5

Motor Vehicle Fatalities, Structurally Deficient Bridges, and Park and Ride Lot Use are the three performance measures which require more efforts regionally to ensure that significant improvements are made to achieve the established regional targets.

13. FUTURE FORECASTS

Air quality conformity regulations related to the latest planning assumptions require a consistent approach to estimate future population, household and employment data used in the regional transportation plan. This data is input into the regional transportation model to estimate future traffic volumes in the region which can in turn be used to analyze the effects of transportation improvement projects, identify areas where congestion could occur in the future, and perform an air quality conformity determination for the region.

MassDOT's Office of Transportation Planning (OTP) led the effort of developing forecasts for future Population, Households, and Employment for Massachusetts including each MPO region. This was a collaborative effort between MassDOT's Office of Transportation Planning (OTP), Metropolitan Area Planning Commission (MAPC), and the UMass Donahue Institute (UMDI). The three entities in consultation with the thirteen regional planning agencies served as the Projections Advisory Group. Together, they were tasked with estimating the potential for future growth and decline across the state over the span of 30 years from 2020 to 2050. The statewide socio-economic projections committee met monthly for a period of 21 months to join efforts in accomplishing the task. This collaborative effort recurs every four years prior to the release of any update to the RTP and STP reports.

In an attempt to refine a previously established process, this time MAPC used a software called UrbanSim to develop a parcel-based Land Use Model to help them estimate housing and labor force for communities statewide. The land use model relied on the development potential gleaned from zoning maps and bylaws available to date. Data sources used in developing the estimates, forecasts and projections are listed in Table 13-1. Procedures and preliminary estimates were reviewed by the

Pioneer Valley Planning Commission (PVPC) staff who regularly submitted feedback and input modification requests steeped in local expert knowledge.

Table 13-1 – Data Sources of Forecasts for the Pioneer Valley Region

- 2020 Census PL94 data.
- Census 2016-2020 ACS Five Year Estimates used by UMass Donahue Institute and MAPC.
- Headship rates derived from ACS Public Use Micro Data Sample (PUMS) 2015-2019 used by MAPC.
- Local Area Unemployment Statistics (LAUS) monthly unemployment data by city/town from 1990 to 2017 sourced from the Massachusetts Executive Office of Labor and Workforce Development.
- Census tract-level commuting pattern data from the Census Bureau's LEHD (Longitudinal Employer-Household Dynamics) Origin-Destination Employment Statistics (LODES), 2016-2020.
- Payroll jobs by place of work and place of residence from ES 202 used by the UMass Donahue Institute.
- Labor Force Statistics from the Current Population Survey (CPS) used by the UMass Donahue Institute.
- Bureau of Labor Statistics (BLS) 2040 employment projections.
- MA Office of Labor and Workforce Development (EOLWD) tables titled Employment and Wages (ES-202) for Hampshire and Hampden counties in 2020 compiled by PVPC staff.
- RPA inputs to MAPC's Mass Builds development database, September 2021 - August 2022.
- Number of units to be built by 2030 as reflected by MassBuilds portal used by MAPC.
- UMass Donahue Institute: Long-term Population Projections for Massachusetts Municipalities and Regional Planning Areas V2022, December 2022.
- MAPC Household Projections, December 2022.
- MAPC Labor Force Projections using ES-202 and DataAxle employment estimates by Super NAICS, January 2023.
- PVPC Planning staff adjustments and calculations: September 2022 - March 2023
- UMass Donahue Institute Employment Projections, expected May 2023.
- MassDOT Planning Projections Final for RTPs, expected June 2023
- Additional details on the most current projection data process by MassDOT, is available upon request.

A. STATEWIDE SOCIO-ECONOMIC DATA PROJECTIONS

Data projections resulting from the statewide land use allocation model estimated a high level of growth during the rest of the current decade in the region. Thereafter, their model estimated a continued decline in population, households, and employment from 2030 until 2050. Estimates are based upon the opportunity for growth and planned development throughout all three forecast years. Only those projects added to the [MassBuilds](#) website and online portal were factored in the model. Population, Household, Labor Force, and Employment totals were calculated at the regional level for RPAs. Whereas total allocations of this data were calculated at a sub-regional level. The resulting forecasts for population, households and employment completed as of 19th May 2023 are shown in Tables 13-2 to 13-4.

These regional projections display the demographic data that was included as part of the statewide model for air quality conformity. An alternate growth scenario was developed by PVPC staff to better reflect local trends and strategic vision for the region. The alternative regional scenario is presented in the following section of this report with the associated data tables.

The long-term population projections for Massachusetts regions and municipalities were updated from values estimated in 2018 by UMDI staff. The methodology used included a migration model. The new population projections results were used in developing demographically based projections for households and labor force. UMDI created a feedback loop between population, households, labor force, and jobs to ensure smooth relationships between factors and conformity to historic trends.

Household projections considered the following variables: group quarter population, age of householder by type of household, rates of household formation by type of household, housing production, headship rates, and jobs.

Labor force projections considered current projections by UMDI for working age and labor force. Additional variables incorporated into the projections included labor force participation rates (LFPRs) by age group and region.

Labor force projections considered current projections by UMDI for working age and labor force. Additional variables incorporated into the projections included labor force participation rates (LFPRs) by age group and region.

Fluctuations in economic cycles were considered in jobs projections of employment. Job growth was constrained by findings from labor force projections and labor force participations rates. Other considerations included the long-term relationship between payroll jobs, working age, and labor force as well as non-employer job trends. Each forecasted demographic data will be discussed further in the following sections on population, households, and employment. Most detailed information about the various projection processes can be found at MassDOT website:

<https://www.mass.gov/lists/socio-economic-projections-for-2020-regional-transportation-plans>

Table 13-2 – Population Forecast for the Pioneer Valley Region by UMDI

	Population 2020 UMDI	Population 2030 UMDI	Population 2040 UMDI	Population 2050 UMDI
Agawam	28,692	28,183	26,744	24,594
Amherst	39,263	37,385	35,965	37,946
Belchertown	15,350	16,563	17,145	16,973
Blandford	1,215	1,038	844	676
Brimfield	3,694	3,634	3,407	3,053
Chester	1,228	1,118	953	767
Chesterfield	1,186	1,075	941	807
Chicopee	55,560	55,545	54,237	52,397
Cumington	829	683	536	398
East Longmeadow	16,430	17,828	19,035	19,437
Easthampton	16,211	16,166	15,405	14,508
Goshen	960	971	979	977
Granby	6,110	5,882	5,499	5,003
Granville	1,538	1,420	1,259	1,045
Hadley	5,325	5,839	6,298	7,029
Hampden	4,966	4,571	3,982	3,298
Hatfield	3,352	3,245	2,980	2,668
Holland	2,603	2,507	2,247	1,973
Holyoke	38,238	38,061	36,845	34,986
Huntington	2,094	1,997	1,851	1,679
Longmeadow	15,853	15,478	15,285	14,543
Ludlow	21,002	19,634	17,706	15,399
Middlefield	385	328	247	170
Monson	8,150	7,536	6,642	5,605
Montgomery	819	819	805	782
Northampton	29,571	29,157	27,909	27,064
Palmer	12,448	11,718	10,522	9,180
Pelham	1,280	1,086	895	739
Plainfield	633	561	490	432
Russell	1,643	1,591	1,521	1,432
South Hadley	18,150	18,169	18,294	18,545
Southampton	6,224	6,370	6,366	6,216
Southwick	9,232	9,206	8,758	7,829
Springfield	155,929	157,442	155,057	151,467
Tolland	471	406	309	240
Wales	1,832	1,744	1,632	1,495
Ware	10,066	10,140	9,934	9,587
West Springfield	28,835	29,138	28,847	28,274
Westfield	40,834	39,322	36,588	33,263
Westhampton	1,622	1,596	1,523	1,399
Wilbraham	14,613	14,921	15,061	14,639
Williamsburg	2,504	2,378	2,153	1,877
Worthington	1,193	942	688	474
Pioneer Valley	628,133	623,393	604,384	580,865

Table 13-3 – Household Forecast for the Pioneer Valley Region by MassDOT

	Households 2020 MassDOT	Households 2030 MassDOT	Households 2040 MassDOT	Households 2050 MassDOT
Agawam	11,905	11,658	11,366	10,808
Amherst	9,784	9,412	9,110	8,737
Belchertown	6,102	5,767	5,717	5,492
Blandford	511	612	607	588
Brimfield	1,496	1,575	1,548	1,484
Chester	535	637	626	607
Chesterfield	536	560	538	518
Chicopee	24,106	24,680	24,310	23,317
Cummington	398	470	463	456
East Longmeadow	6,134	5,783	5,671	5,349
Easthampton	7,517	7,343	7,248	6,985
Goshen	431	488	491	473
Granby	2,401	2,423	2,394	2,282
Granville	606	657	647	618
Hadley	2,212	2,230	2,179	2,106
Hampden	1,945	1,837	1,809	1,721
Hatfield	1,558	1,537	1,525	1,442
Holland	1,095	1,115	1,106	1,067
Holyoke	15,504	15,984	15,674	15,113
Huntington	869	918	902	888
Longmeadow	5,751	5,754	5,669	5,403
Ludlow	8,404	8,092	7,977	7,575
Middlefield	174	247	242	238
Monson	3,371	3,350	3,306	3,176
Montgomery	337	347	345	334
Northampton	12,799	12,515	12,303	11,839
Palmer	5,448	5,238	5,140	4,919
Pelham	544	572	564	537
Plainfield	285	317	314	300
Russell	647	685	678	653
South Hadley	7,077	6,768	6,650	6,378
Southampton	2,446	2,295	2,277	2,168
Southwick	3,825	3,679	3,602	3,443
Springfield	58,794	59,556	58,357	56,184
Tolland	221	254	253	240
Wales	757	783	777	745
Ware	4,321	4,300	4,210	4,038
West Springfield	12,241	12,233	11,966	11,441
Westfield	15,887	15,399	15,145	14,502
Westhampton	662	683	674	650
Wilbraham	5,510	5,119	5,020	4,769
Williamsburg	1,109	1,178	1,177	1,119
Worthington	549	587	581	573
Pioneer Valley	246,804	245,637	241,158	231,275

Table 13-4 – Employment Forecast for the Pioneer Valley Region by MassDOT

	Employment 2020 MassDOT	Employment 2030 MassDOT	Employment 2040 MassDOT	Employment 2050 MassDOT
Agawam	12,265	11,916	11,469	11,146
Amherst	16,204	15,919	15,601	15,336
Belchertown	3,780	4,347	4,315	4,295
Blandford	199	171	159	149
Brimfield	613	682	662	643
Chester	121	137	129	126
Chesterfield	124	137	132	127
Chicopee	21,668	23,267	22,891	22,637
Cummington	232	258	248	244
East Longmeadow	7,894	7,752	7,436	7,164
Easthampton	4,701	4,679	4,518	4,391
Goshen	135	114	108	105
Granby	1,081	1,221	1,203	1,173
Granville	151	144	136	126
Hadley	6,104	5,833	5,550	5,320
Hampden	986	1,065	1,040	1,016
Hatfield	2,343	2,668	2,679	2,720
Holland	137	133	125	124
Holyoke	23,682	23,204	22,683	22,331
Huntington	452	457	452	443
Longmeadow	4,071	4,267	4,221	4,202
Ludlow	7,069	7,313	7,132	6,974
Middlefield	32	30	30	25
Monson	1,736	1,965	1,946	1,915
Montgomery	23	22	20	18
Northampton	18,642	18,387	17,963	17,566
Palmer	5,813	5,854	5,686	5,516
Pelham	142	129	123	119
Plainfield	34	31	29	27
Russell	167	173	160	152
South Hadley	5,131	5,270	5,136	5,005
Southampton	1,244	1,266	1,203	1,148
Southwick	2,814	2,823	2,655	2,552
Springfield	86,320	87,949	87,451	87,492
Tolland	34	32	27	22
Wales	129	122	118	110
Ware	3,167	3,205	3,130	3,060
West Springfield	17,804	17,537	17,026	16,697
Westfield	17,928	17,980	17,421	16,983
Westhampton	430	498	491	480
Wilbraham	4,815	4,655	4,510	4,379
Williamsburg	475	428	391	362
Worthington	188	175	170	169
Pioneer Valley	281,080	284,215	278,575	274,589

1. Population

The Population Projections Model developed by UMDI provided population projections by age and sex as well as by race and ethnicity for each of the MPO regions. Population change is impacted by domestic migration, international migration, as well as natural increases due to births. UMDI developed migration rates using the averaged data from the 2012 to 2019 ACS Public Use Micro-Samples (PUMS). This effort was an update to the launch population using the Vintage 2019 UMDI control estimates extrapolated to the 2020 estimate. The update included reviewing changes in statewide fertility, mortality, and migration trends to calculate birth rates, survival rates, and migration rates. The population documentation detail can be found on UMDI's website: <https://donahue.umass.edu/business-groups/economic-public-policy-research/massachusetts-population-estimates-program/population-projections>

A college fix was applied to the population of regions with a high percentage of college students. This is because the college population does not age or migrate, while non-college population ages forward and is subject to (non-college) rates of migration by cohort. The college population was calculated by applying the region's share of this age cohort from that of total U.S. cohort using data from the 2012-2019 ACS. This methodology recognized that a percentage of the college population may age in place and join the non-college population. This college fix was applied to population projections in Hampshire County in the Pioneer Valley region.

Thereafter, each community in the Pioneer Valley region was reviewed in detail with regards to these population estimates. Regional staff looked specifically at past trends, growth allocations in past projections, as well as recent building permit activity. A recent rise in building-permit activity was viewed as an indicator of potential growth. Adjustments were made to projections based on past growth patterns, land use, economic development, and transportation trends. This regional scenario resulted in departure from the regional control total developed by MassDOT.

2. Households

The Household Model developed by MAPC used the UMDI population projections. The portion of the population in households was calculated by subtracting those living in group quarters, based on Census 2010 rates by age and municipality. Living arrangements were then categorized by applying region-specific rates of household type and householder status from the 2012-2019 Public Use Microdata Sample (PUMS) data. Three household type categories were used: single person, household with child under 18, and all other households without children. Finally, the number of households were calculated by multiplying the rates derived from the PUMS data by the population projected by UMDI as categorized by age and sex for year 2020 and projected forward for future years.

The total number of households allocated to Transportation Analysis Zones (TAZs) using the UrbanSim land use model was classified by income, household size, number of workers and then aggregated into each community. The number of households by community for the state of Massachusetts was projected into the future and furnished to its 13 regional planning agencies. PVPC staff gave feedback on the number of households allocated to its communities with a request for modification of the inputs of the statewide land use model.

3. Employment

Labor force projections by MAPC were rooted by UMDI's population projections for 2020 as well as their projections for future years 2030, 2040 and 2050. They generated a statewide potential labor force from the projected household population. These labor force projections formed the basis of UMDI's employment analysis. The calculations considered changes in Massachusetts' overall population, the aging of the present population into older age cohorts with lower levels of labor force participation (relative to the core 25-64 core workforce), and educational attainment levels.

Based on these steps the employment in Massachusetts was projected for the state and divided into the regional planning areas. The Labor Force estimates by MAPC were incorporated into the employment projections by UMDI to estimate the future employment base and unemployment rates. Labor force projections by MAPC were subsequently adjusted by UMDI to address the difference between the number of potential workers and available jobs. Their employment estimates also addressed the number of workers potentially coming from out of state or other regions as well as those going out of the region. Workplace-based employment data was used in future projections. The regional and community employment projections were provided by MassDOT staff based on UMDI estimates.

Block group level socio-economic data values were classified using ratios according to 2010 data since classifications of the newer 2020 Census have not been released yet at the time of this report. Block group level classifications of households and employment from the 2010 census were applied to year 2020 and three future year projections of socio-economic data to be used in modeling travel demand.

The PVPC staff provided feedback and adjusted community and regional totals of socio-economic projection estimates for the year 2030 to reflect local growth witnessed in recent years from development in some of the urbanized communities such as Springfield and Holyoke. This created an alternate growth scenario to be used in the regional transportation model different from the one used by the statewide model for future years 2030, 2040, and 2050.

The adjusted values considered the potential positive impact of increased rail service frequency and employment on regional population. It incorporated other related

developments in the City of Springfield and surrounding areas which opened the door to an intrastate migration from east to west along the path of the rail line.

B. REGIONAL SOCIO-ECONOMIC DATA PROJECTIONS

The initial municipal socio-economic data projection estimates, displayed in the previous section, were provided by MassDOT. Thereafter, PVPC staff adjusted these values by reallocating growth among communities based on current trends and local staff knowledge of opportunities for additional growth and major development planned throughout all forecast years from 2030 through 2050. An alternate regional specific scenario for growth in population, households, and employment in future forecast years was subsequently developed by the Pioneer Valley Planning Commission staff. A description of the forecast process and summary of the calculation methods ensues.

Upon reviewing the values estimated by MassDOT's partners, for each of the communities within the Pioneer Valley, it became clear that the totals allocated to certain communities were very different from local experience and expectation regarding the magnitude of growth or decline. Therefore, an alternate regional specific scenario for growth in population, households, and employment estimates for future forecast years were subsequently developed by the PVPC to be used in updating the regional travel demand model for the Pioneer Valley MPO.

An internal team of PVPC staff convened to analyze and reallocate population and employment projection totals to the 43 communities in the Pioneer Valley region based on their potential for future growth and better represent current trends and expected future change. The base year 2020 regional and community values for total number of households were calculated by considering census data about occupied housing units indicative of the number of households. This follows a similar assumption used by MAPC, as mentioned previously. Household projections were then calculated based on population growth trends by applying the ratios of the Number of Occupied Housing Units to Population Volume by community, using data from the 2020 Census.

The travel demand model uses the value of household population as one of its key inputs. The value of household population is equal to the total population minus group quarter (GQ) population. Therefore, subtracting the household population from the total population of each community would yield the population living in group quarters. Census 2020 data available to date was used in these calculations per community and ratios were carried forward into future years based on anticipated growth rates in population and employment as determined by PVPC.

Further disaggregation of data from the Town-level to the TAZ-level was carried out by applying ratios derived from the previous regional model which used the 2010 Census population, households, and employment values. The 2010 data was

aggregated at the Block Group level from the Census Blocks level data available at the time. Further classifications of households into categories of income, size, number of vehicles, number of workers and a breakdown of employment type by sector was conducted based on ratios derived from the original 2000 Census base year of the regional travel demand model using data from the five-year American Community Survey (ACS). In the future, when newer data is released to the public by the Census Bureau, PVPC staff plans to adjust the regional model data inputs accordingly.

The population, households, and employment data projections developed for the alternative regional growth scenario are displayed in Tables 13-5 – 7. The community totals in these tables were used as basis for the disaggregate data classifications required for the update to the PVPC regional transportation travel demand model.

Table 13-5 – Population Forecast for the Pioneer Valley Region

	Population 2020	Population 2030	Population 2040	Population 2050
Agawam	28,692	28,979	29,122	29,266
Amherst	39,263	40,441	41,030	41,619
Belchertown	15,350	15,811	16,041	16,271
Blandford	1,215	1,227	1,233	1,239
Brimfield	3,694	3,879	3,868	3,916
Chester	1,228	1,240	1,246	1,253
Chesterfield	1,186	1,198	1,204	1,210
Chicopee	55,560	56,116	56,393	56,671
Cummington	829	837	841	846
East Longmeadow	16,430	17,169	17,662	18,073
Easthampton	16,211	16,697	16,940	17,184
Goshen	960	970	974	979
Granby	6,110	6,171	6,202	6,232
Granville	1,538	1,553	1,561	1,569
Hadley	5,325	5,858	5,991	6,124
Hampden	4,966	5,016	5,040	5,065
Hatfield	3,352	3,386	3,402	3,419
Holland	2,603	2,629	2,642	2,655
Holyoke	38,238	39,768	40,341	40,915
Huntington	2,094	2,115	2,125	2,136
Longmeadow	15,853	15,932	15,972	16,012
Ludlow	21,002	21,632	21,842	22,052
Middlefield	385	389	391	393
Monson	8,150	8,476	8,517	8,558
Montgomery	819	827	831	835
Northampton	29,571	30,458	30,902	31,345
Palmer	12,448	12,759	12,884	13,070
Pelham	1,280	1,293	1,299	1,306
Plainfield	633	639	642	646
Russell	1,643	1,659	1,668	1,676
South Hadley	18,150	18,695	18,967	19,239
Southampton	6,224	6,411	6,504	6,597
Southwick	9,232	9,324	9,370	9,417
Springfield	155,929	159,048	160,607	162,166
Tolland	471	476	478	480
Wales	1,832	1,850	1,859	1,869
Ware	10,066	10,267	10,368	10,469
West Springfield	28,835	29,123	29,268	29,412
Westfield	40,834	41,242	41,447	41,651
Westhampton	1,622	1,638	1,646	1,654
Wilbraham	14,613	14,759	14,832	14,905
Williamsburg	2,504	2,529	2,542	2,554
Pioneer Valley	628,133	641,691	647,905	654,165

Table 13-6 – Household Forecast for the Pioneer Valley Region

	Households 2020	Households 2030	Households 2040	Households 2050
Agawam	11,905	12,024	12,084	12,143
Amherst	9,784	10,078	10,224	10,371
Belchertown	6,102	6,285	6,377	6,468
Blandford	511	516	519	521
Brimfield	1,496	1,571	1,566	1,586
Chester	535	540	543	546
Chesterfield	536	541	544	547
Chicopee	24,106	24,347	24,468	24,588
Cummington	398	402	404	406
East Longmeadow	6,134	6,410	6,594	6,747
Easthampton	7,517	7,743	7,855	7,968
Goshen	431	435	437	440
Granby	2,401	2,425	2,437	2,449
Granville	606	612	615	618
Hadley	2,212	2,433	2,489	2,544
Hampden	1,945	1,964	1,974	1,984
Hatfield	1,558	1,574	1,581	1,589
Holland	1,095	1,106	1,111	1,117
Holyoke	15,504	16,124	16,357	16,589
Huntington	869	878	882	886
Longmeadow	5,751	5,780	5,794	5,809
Ludlow	8,404	8,656	8,740	8,824
Middlefield	174	176	177	177
Monson	3,371	3,506	3,523	3,540
Montgomery	337	340	342	344
Northampton	12,799	13,183	13,375	13,567
Palmer	5,448	5,584	5,639	5,720
Pelham	544	549	552	555
Plainfield	285	288	289	291
Russell	647	653	657	660
South Hadley	7,077	7,289	7,395	7,502
Southampton	2,446	2,519	2,556	2,593
Southwick	3,825	3,863	3,882	3,902
Springfield	58,794	59,970	60,558	61,146
Tolland	221	223	224	225
Wales	757	765	768	772
Ware	4,321	4,407	4,451	4,494
West Springfield	12,241	12,363	12,425	12,486
Westfield	15,887	16,046	16,125	16,205
Westhampton	662	669	672	675
Wilbraham	5,510	5,565	5,593	5,620
Williamsburg	1,109	1,120	1,126	1,131
Worthington	549	554	557	560
Pioneer Valley	246,804	252,076	254,481	256,905

Table 13-7 – Employment Forecast for the Pioneer Valley Region

	Employment 2020	Employment 2030	Employment 2040	Employment 2050
Agawam	10,218	10,473	10,578	10,631
Amherst	15,368	15,829	15,987	16,067
Belchertown	2,605	2,631	2,657	2,671
Blandford	166	168	169	170
Brimfield	570	576	581	584
Chester	95	96	97	97
Chesterfield	159	161	162	163
Chicopee	18,656	19,216	19,408	19,505
Cummington	261	264	266	268
East Longmeadow	7,517	7,667	7,744	7,783
Easthampton	4,533	4,760	4,807	4,831
Goshen	151	153	154	155
Granby	943	952	962	967
Granville	119	120	121	122
Hadley	5,560	5,727	5,784	5,813
Hampden	963	973	982	987
Hatfield	2,000	2,020	2,040	2,050
Holland	207	209	211	212
Holyoke	20,306	20,712	20,919	21,024
Huntington	353	357	360	362
Longmeadow	3,900	3,939	3,978	3,998
Ludlow	6,361	6,552	6,617	6,650
Middlefield	37	37	38	38
Monson	1,554	1,570	1,585	1,593
Montgomery	36	36	37	37
Northampton	18,746	19,121	19,312	19,409
Palmer	4,268	4,396	4,440	4,462
Pelham	146	147	149	150
Plainfield	97	98	99	99
Russell	134	135	137	137
South Hadley	4,462	4,507	4,552	4,574
Southampton	1,020	1,030	1,041	1,046
Southwick	2,683	2,710	2,737	2,751
Springfield	77,279	78,438	79,223	79,619
Tolland	33	33	34	34
Wales	172	174	175	176
Ware	2,442	2,466	2,491	2,504
West Springfield	15,544	15,777	15,935	16,015
Westfield	16,906	17,329	17,502	17,589
Westhampton	327	330	334	335
Wilbraham	5,274	5,353	5,407	5,434
Williamsburg	512	517	522	525
Worthington	165	167	168	169
Pioneer Valley	252,848	257,926	260,502	261,806

C. SUMMARY

This section includes a brief comparison between the statewide and the regional growth scenario for the regional socio-economic data projections by community as developed by the Pioneer Valley Planning Commission staff for use as inputs in the regional model and RTP analysis. These in-house projections were based on the officially released Census 2020 population and number of occupied housing units, as well as 2020 employment values gathered from the EOWLD as provided by the in-house Regional Information and Policy Center staff.

The statewide projections for the Pioneer Valley region show a change in demographics with an initial growth in employment during the current decade, but an overall decline over the 30-year period in population, households and employment (Table 13-8). The change occurring each decade fluctuates in magnitude but continues to decline. In comparison, the regional in-house scenario forecasts a steady growth in population, household, and employment, which tapers off with passage of time during the 30-year span of the plan (Table 13-9). The local growth scenario results in a positive outlook for the Pioneer Valley, while recognizing a slowdown in growth with passage of time.

Table 13-8 – Projected Change in Pioneer Valley Region by UMDI/MassDOT

Pioneer Valley UMDI/MassDOT	Change 2020-2030	Change 2030-2040	Change 2040-2050	Change 2020-2050
Population	-0.8%	-3.0%	-3.9%	-7.5%
Households	-0.5%	-1.8%	-4.1%	-6.3%
Employment	1.1%	-2.0%	-1.4%	-2.3%

Table 13-9 – Projected Change in Pioneer Valley Region

Pioneer Valley	Change 2020-2030	Change 2030-2040	Change 2040-2050	Change 2020-2050
Population	2.2%	1.0%	1.0%	4.1%
Households	2.1%	1.0%	1.0%	4.1%
Employment	2.0%	1.0%	0.5%	3.5%

Among the differences between the two scenarios is that the regional alternative growth scenario added 18,298 more people, and 6,439 more households in future year 2030 over the statewide projections for the same year. Whereas MassDOT's projected employment for 2030 was 26,289 more than in the regional scenario, it declined drastically post 2030. The in-house alternative regional scenario is preferred over the statewide scenario for use in the regional travel demand model because it reflects a steady growth over the 30-year span of the regional plan, thus closely resembling past trends and current vision for additional growth.

The regional projections assume a positive impact on population and employment because of current success from the expanded passenger rail service along the Knowledge Corridor line. They also incorporate the future positive implications of expansion of East-West passenger rail and its potential for improving the connection between Boston and Western Massachusetts. The local socio-economic data projections were developed based on the following assumptions:

- Population continues to grow in most communities of the Pioneer Valley. Growth rate ranges from 0.5 to 15% between 2020 and 2030. It tapers down beyond that point at a rate dependent on specific trends for each community.
- Fourteen communities in the region would grow more in employment than the rest. Listed in alphabetical order these are: Agawam, Amherst, Chicopee, East Longmeadow, Easthampton, Hadley, Holyoke, Ludlow, Northampton, Palmer, Springfield, West Springfield, Westfield, Wilbraham.
- Growth communities received higher future growth rates based on the growth trends seen in employment between 2010, 2015 and 2019.
- Employment growth rates between 2020 and 2030 ranged between 1% to 3% for the 43 communities in the Pioneer Valley.
- The expected employment growth rate between 2030 and 2040 is 1%.
- The expected employment growth rate between 2040 and 2050 is 0.5%.

To develop the regional scenario, PVPC staff met internally to discuss the socio-economic data received from various sources and identify opportunities of growth. The staff plan to continue working with the Joint Transportation Committee (JTC) and Valley Development Council (VDC) to provide updates for this scenario as needed.

D. REGIONALLY SIGNIFICANT PROJECTS

“Regionally Significant” projects must be included in travel demand modeling efforts. The final federal conformity regulations define regionally significant as follows:

Regionally significant: a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sport complexes, etc., or transportation terminals as well as most terminals themselves) and would be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

“Non-Exempt” projects add capacity to the existing transportation system and must be included as part of the air quality conformity determination for the RTP. Examples of “Non-Exempt” projects include those defined as regionally significant in addition to projects expected to widen roadways for the purpose of providing additional travel lanes.

Projects considered regionally significant were included as part of the 2020 Baseline model network and subsequent future model networks based on the project's expected construction date. These projects include non-exempt system expansion projects that were financially constrained.

The baseline 2020 model network includes the following regionally significant projects:

- Passenger Rail Service from Hartford, CT to Greenfield, MA. (not modeled)
- Extension of the North South Passenger Rail Service from Springfield to serve stations in Holyoke, Northampton and Greenfield. (not modeled)

The 2030 base year roadway network includes all regionally significant TIP projects that were already included in the 2020 model network as well as projects that were completed by the end of 2030. Those projects include the following:

- Hadley -Route 9 widening from Middle Street to Maple Street from one lane in each direction to two lanes in each direction. Construction expected to be completed in 2026.

The 2040 model network may include Visionary Projects that are anticipated in the distant future such as the following regionally significant projects:

- East-West Passenger Rail between Worcester to Springfield pending the current MassDOT study. Expected by 2035.
- I-90 Exit 41 on-ramp modification in Westfield.

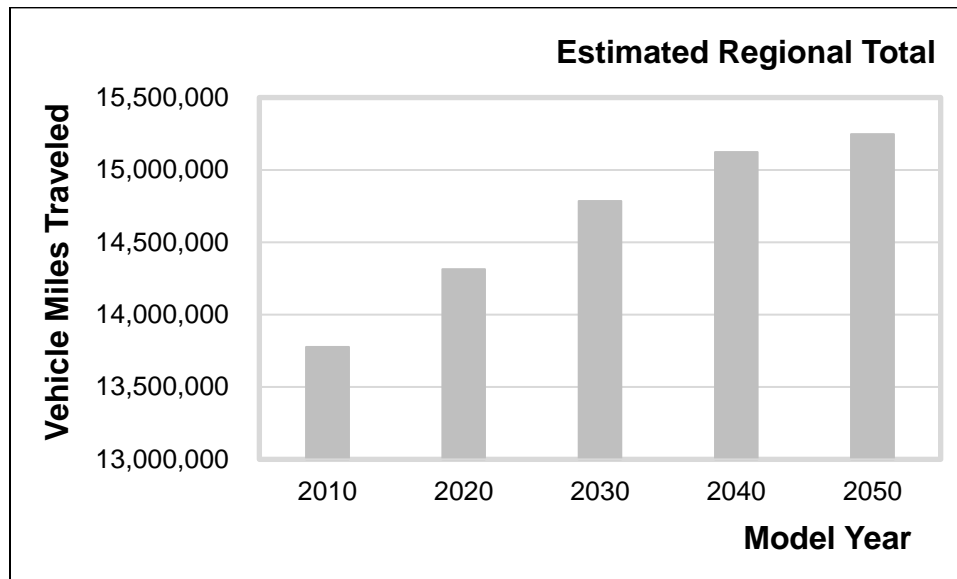
The 2050 model network may include Visionary Projects that are anticipated in the distant future such as the following regionally significant projects:

- MassDOT I-91 Viaduct Study Recommendations:
 - Interstate I-91 and South End Bridge improvements.
 - The installation of collector-distributor roads alongside I-91 mainline and roundabouts at South End Bridge and U.S. Route 5; reduction in on/off ramps; realignment of I91 mainline; and elimination of existing lane drops in the vicinity of the South End Bridge.
 - Replacement of Agawam Rotary with modified diamond interchange; replacement of South End Bridge and Westfield River Bridge to provide two travel lanes in each direction and a new shared-use path; new acceleration and deceleration lanes and proper left and right shoulders on both bridges; access to/from Meadow Street.
 - Replacement of Plainfield Street bridges over I-91 and the existing railroad tracks with a third westbound travel lane.
 - Relocation of the existing left side on-ramp from I-291 to I-91 South Bound to a more traditional right side on-ramp.

E. ESTIMATED REGIONAL VEHICLE MILES TRAVELED

Total Vehicle Miles Traveled (VMT) was estimated for four model years that represent the socio-economic conditions at the top of each decade. An older estimate for 2010 is included in the chart to show the upward direction of change, which continues from the new Base-Year 2020 and thereafter into future Build-Years of 2030, 2040, and 2050. The total VMT growth at the beginning of each decade is shown in Figure 13-1 represented by the difference in the bar heights. The total VMT is projected to increase by 0.3% per year from 2020 to 2030, by 0.2% per year from 2020 to 2040, and by 0.1% from 2040 to 2050.

Figure 13-1 - Estimated Future VMT



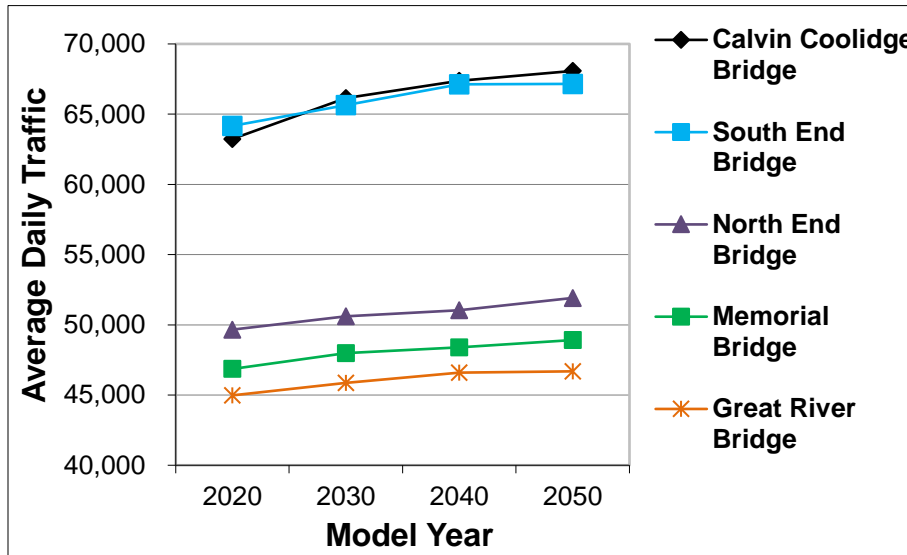
F. FUTURE TRAFFIC VOLUME PROJECTIONS

The Regional Travel Demand Model projections supply estimates for the Average Daily Traffic (ADT) volumes on major roadways in the Pioneer Valley region. The following is a selection of major roadway links, which were chosen for analysis by comparing the model estimates from various model years at these locations. In this section, key regional roadways are highlighted. These include bridges, interstate highways, and major corridors.

1. Bridges

The estimated ADT on five of the region's bridges are displayed in the following chart as projected to occur in each of the four model years. These bridges include: the South End Bridge, the Calvin Coolidge Bridge, the Memorial Bridge, North End Bridge, and the Great River Bridge. This chart is color coded by bridge and there is a line connecting time points to help trace trend lines over the 30-year period from 2020 to 2050, Figure 13-2.

Figure 13-2 - Projected Average Daily Traffic on Area Bridges

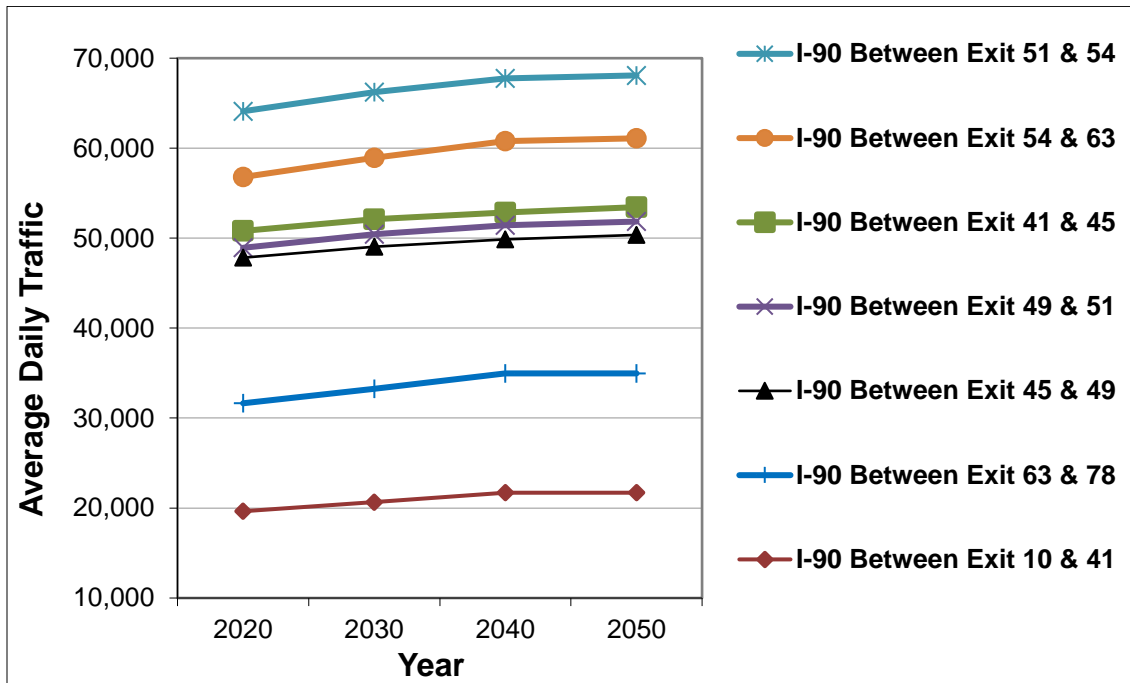


As shown in Figure 13-2, the ADT on the Calvin Coolidge Bridge is projected to significantly increase from 2020 to 2030 and then continue at a more moderate rate thereafter until 2050. This is likely the result of forecasted growth in employment along the Route 9 corridor due to new development construction. In addition, there is a Route 9 widening project from one lane to two lanes through Hadley from Middle Street to Maple Street. This increased lane capacity would facilitate additional traffic movement in the area. These roadway changes are incorporated into the roadway network of the 2030 model year and later future travel demand models.

2. Interstate 90 (Massachusetts Turnpike)

Within the Pioneer Valley region, traffic volumes on Interstate 90 (I-90) are projected to steadily increase along the highway between exits 45 and 63 from 2020 to 2050, as shown in Figure 13-3. The projected growth in ADT is a result of the estimated growth in population, households, and employment that is reflected by the socio-economic projections developed for the Pioneer Valley over the 30-year span of the Regional Transportation Plan. The following chart displays the ADT growth trend at seven points along I-90. Locations of the estimates are color-coded and referenced within the chart's legend.

Figure 13-3 - Projected Average Daily Traffic on Interstate 90 (Massachusetts Turnpike)

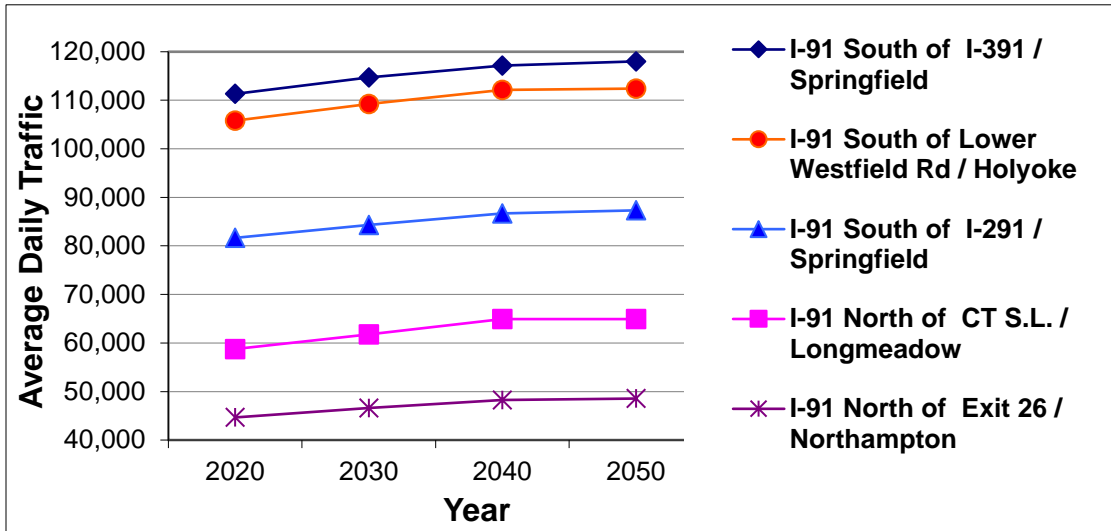


3. Interstate 91 (I-91)

The Average Daily Traffic (ADT) estimates along I-91 are displayed at five points along its North- South path for the four model years as shown in Figure 13-4. These points include North of the Connecticut State line in the Town of Longmeadow, South of I-291 in the City of Springfield, South of I-391 in City of Springfield, South of Lower Westfield Road in the City of Holyoke, and North of Exit 26 in City of Northampton.

In general, traffic volumes were estimated to steadily increase along I-91 within the Pioneer Valley region until the year 2040. Traffic volumes along I-91 remain steady after the year 2040 at a slower pace of growth. Similar patterns of growth in traffic flow are expected to occur throughout the region.

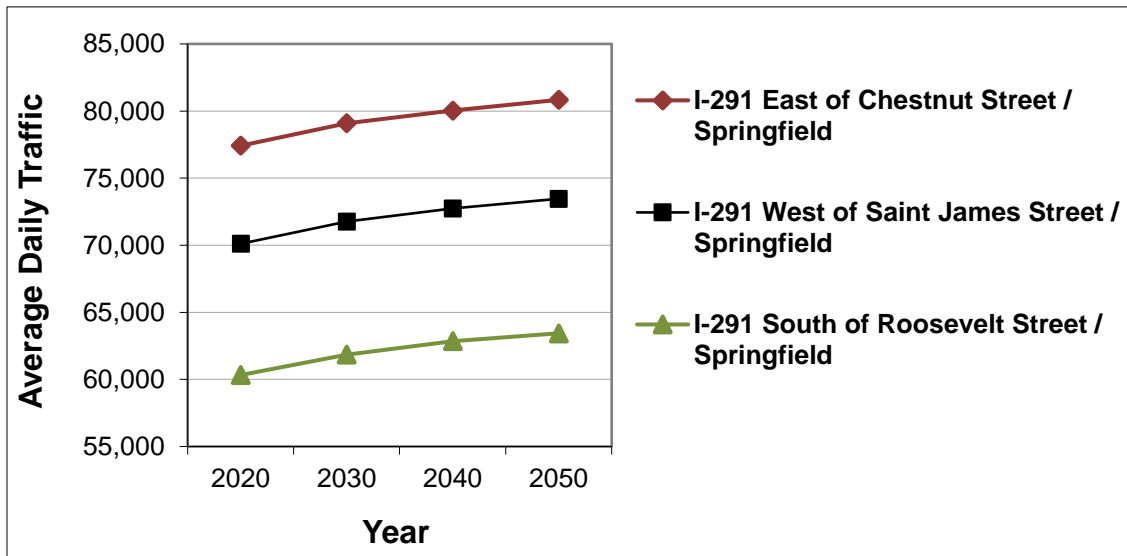
Figure 13-4 - Projected Average Daily Traffic on Interstate 91



4. Interstate 291 (I-291)

Figure 13-5 shows the estimated traffic volumes for three locations in Springfield along I-291: East of Chestnut Street, West of Saint James Street, and South of Roosevelt Street. Steady increases in traffic volume were projected.

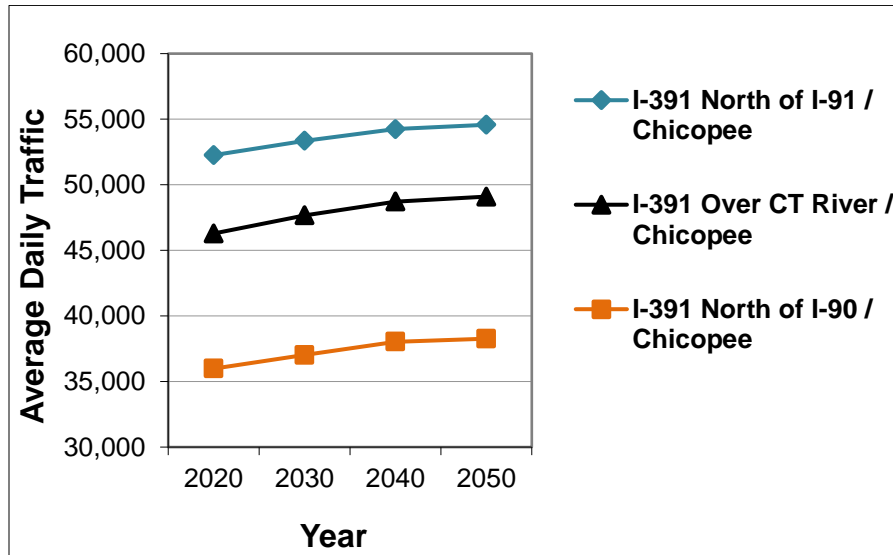
Figure 13-5 - Projected Average Daily Traffic on Interstate 291



5. Interstate 391

Traffic volumes on Interstate 391 (I-391) are shown in Figure 13-6 at three points along the highway in the City of Chicopee: North of I-91, North of I-90, and along the roadway segment crossing the Connecticut River. Moderate increases in traffic volumes are projected for this highway.

Figure 13-6 - Average Daily Traffic on Interstate 391



6. Arterials

Traffic volumes for major arterial roadways at the four corners of the Pioneer Valley Region are shown in Figures 13-7 through 13-10. The region's northeast area includes Route 9, Route 116, Route 202, and Route 181. The region's northwest area includes Route 5, Route 141, and Route 66. The region's southeast area includes Route 33, Route 83, Route 21, and Route 20. The region's southwest area includes Route 10/202, Route 20, and Route 57. The traffic volumes of these routes are expected to increase moderately over the span of the next 30 years.

The highest increase in traffic volumes are expected to occur along Route 9 in Hadley near the Amherst Town Line and along Route 57 West of Route 75 in Agawam. This growth trend is projected over a 20-year span along these two corridors.

Figure 13-7 - Average Daily Traffic on Northeast Arterial Roadways

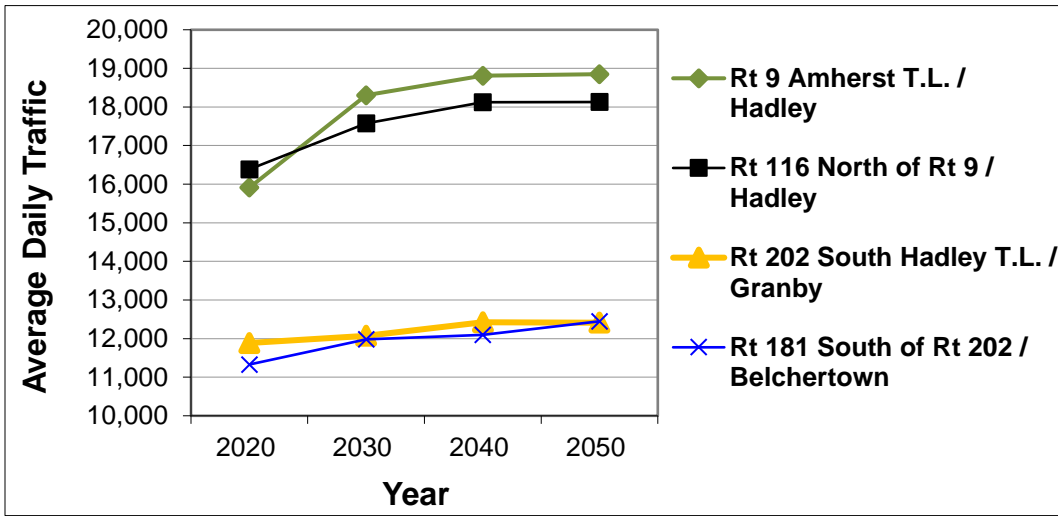


Figure 13-8 - Average Daily Traffic on Northwest Arterial Roadways

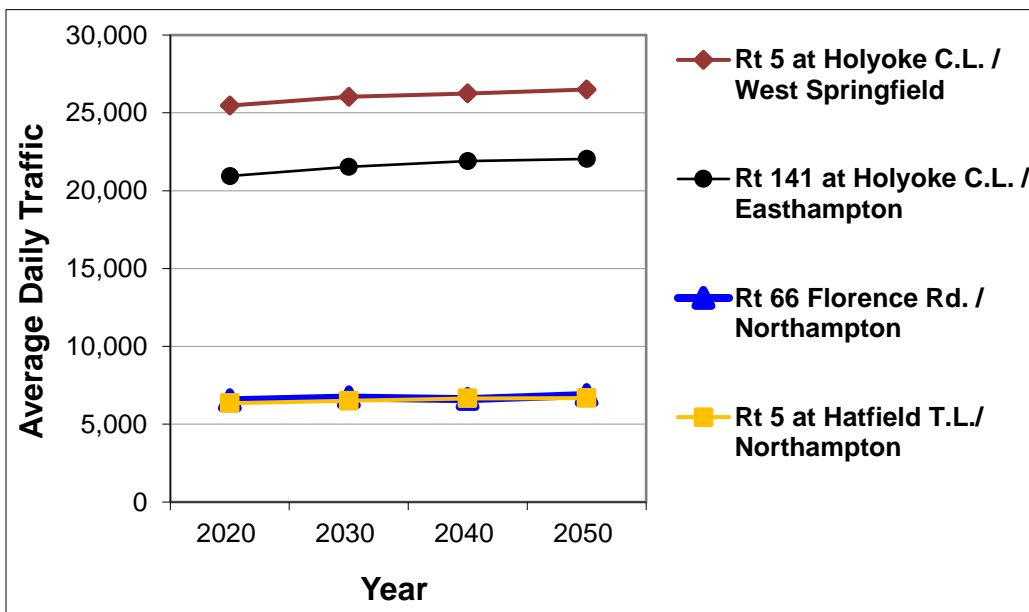


Figure 13-9 - Average Daily Traffic on Southeast Arterial Roadways

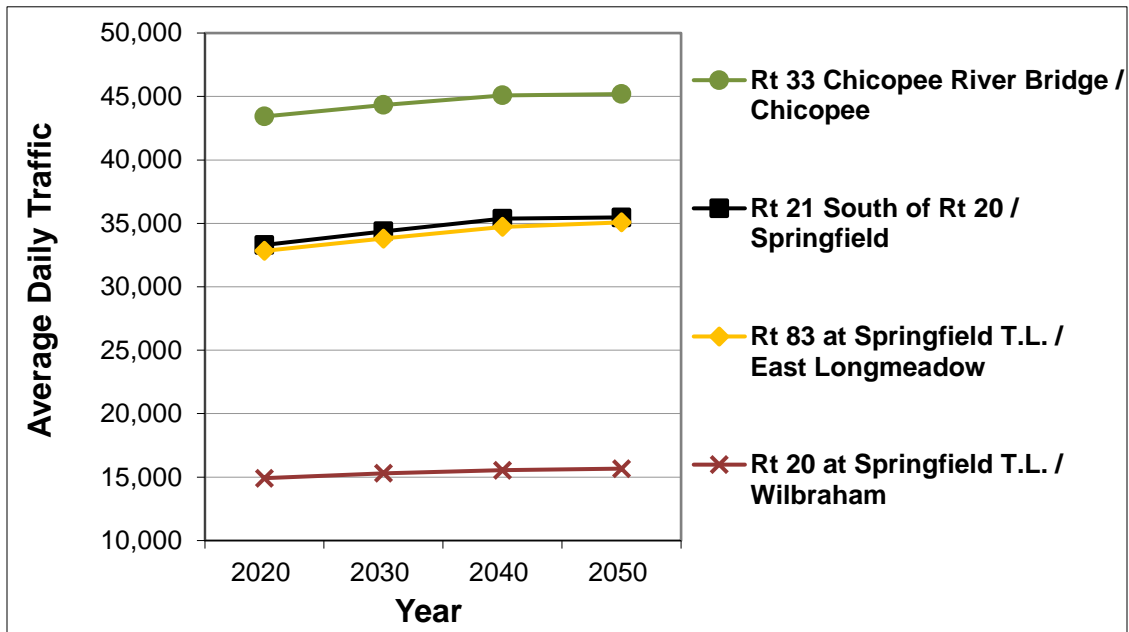
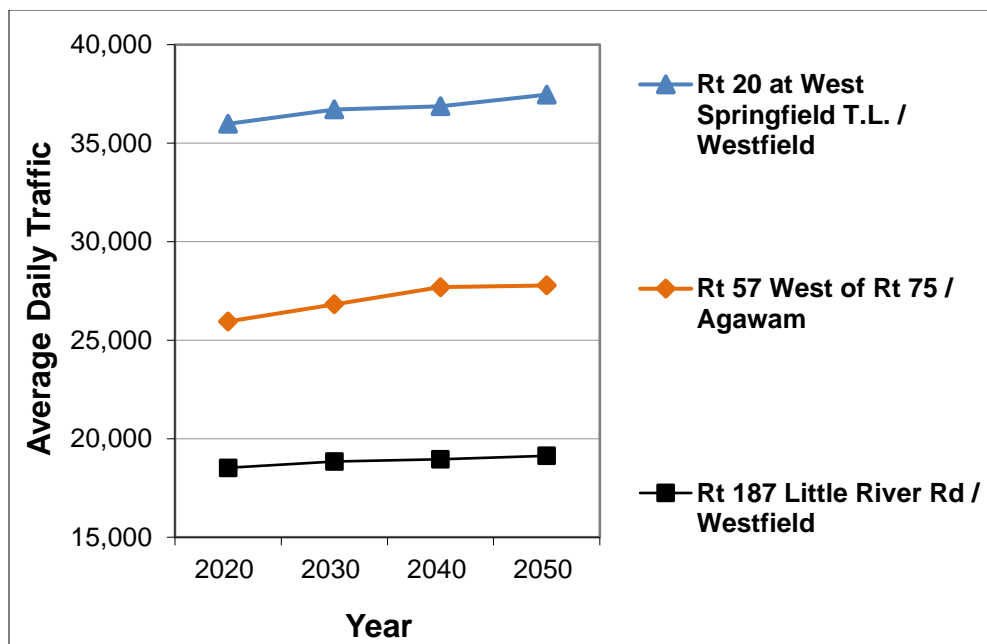


Figure 13-10 - Average Daily Traffic on Southwest Arterial Roadways





14. NEEDS, STRATEGIES AND PROJECTS

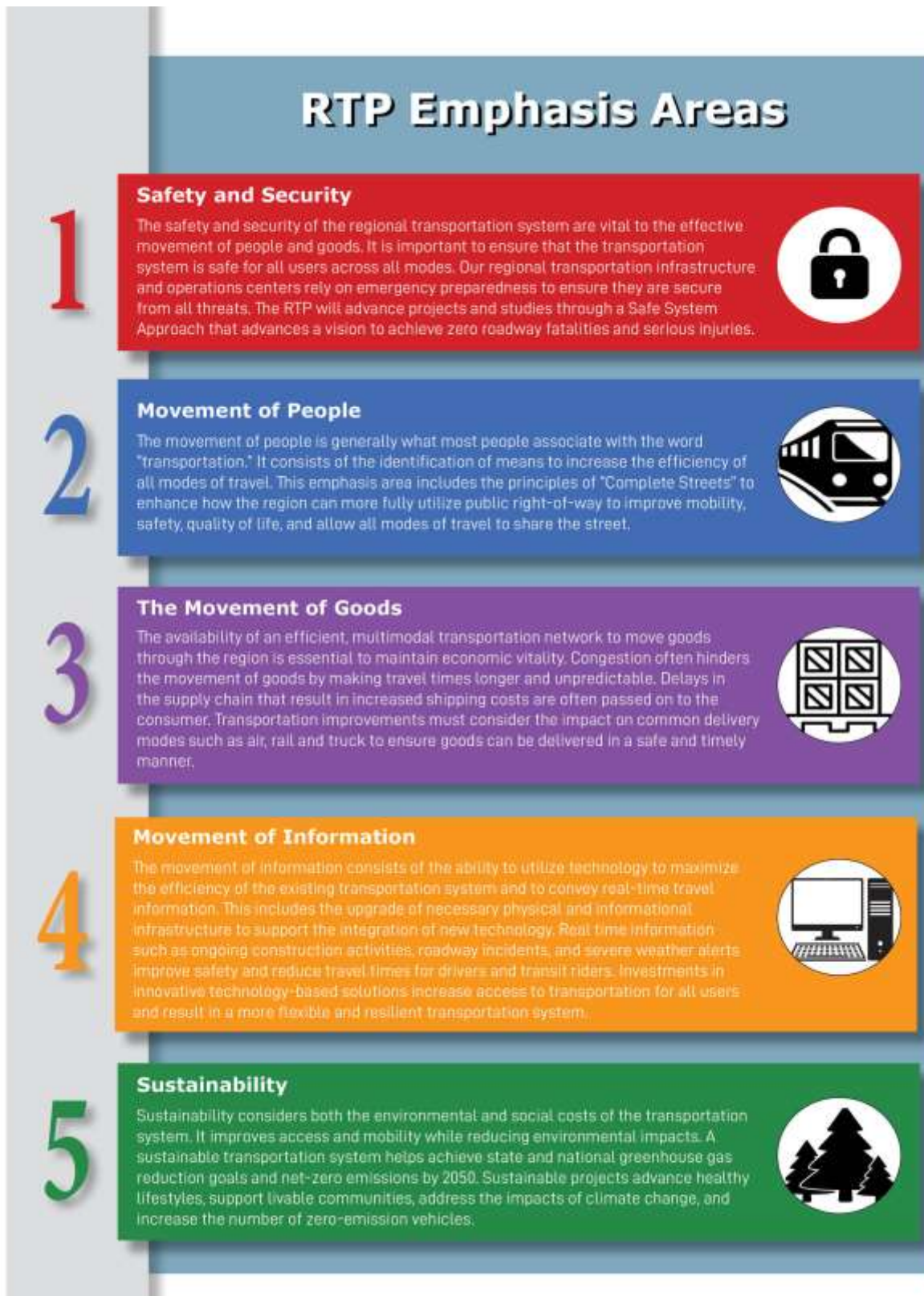
The vision of the RTP focuses on the attainment of a safe and dependable transportation system. To achieve this vision and its associated goals, regional transportation needs have been identified. The second step is to develop appropriate strategies to address these needs while adhering to the policies and objectives of the RTP. The third and final step is to advance planning studies and implement improvement projects that will enhance the transportation system in a manner consistent with our vision.

Emphasis areas were identified to assist in the achievement of the RTP vision and goals. These emphasis areas are not intended to be a replacement for the regional transportation goals. Instead, they were established with the recognition that many of the transportation improvement strategies included as part of the RTP Update can meet multiple regional transportation goals. The five emphasis areas are:

- Safety and Security (S&S)
- Movement of People (MoP)
- Movement of Goods (MoG)
- Movement of Information (Mol)
- Sustainability (S)

The transportation emphasis areas are related to each of the thirteen Regional Transportation Goals. Needs and Strategies were developed for each emphasis area to advance each of the twelve goals without the need for repetitiveness. More information on the five RTP Emphasis Areas is presented in Figure 14-1.

Figure 14-1 - RTP Emphasis Areas



A. NEEDS

Regional transportation needs have been identified and summarized by emphasis area in Tables 14-1 – 14-5. Each need has been prioritized as either “Immediate,” “Future,” or “Ongoing.” Immediate needs are areas that are a high priority and must be addressed through the implementation of future planning studies and projects. Future needs are areas of medium importance that should be addressed in the development of future projects. Ongoing needs are areas that require routine attention and that are already included as part of the regional planning process.

Table 14-1 - Safety and Security Needs (S&S)

1	Reverse the trend of the rising number of fatal and incapacitating injury crashes in the region, including disproportionately impacted environmental justice populations and vulnerable users.	Immediate
2	Address ongoing construction activities, special events and major incidents that can negatively impact emergency responders.	Ongoing
3	Improve safety at freight facilities and at-grade railroad crossings. Prohibit unauthorized access to freight facilities.	Ongoing
4	Improve knowledge and compliance with existing Emergency Evacuation plans.	Ongoing
5	Protect critical/at-risk regional transportation infrastructure.	Ongoing
6	Ensure the safety and security of mass transit facilities and equipment.	Ongoing
7	Provide for the safety and security of hazardous materials while in transportation and in storage.	Immediate
8	Improve access to driver, bicycle, and pedestrian education.	Immediate
9	Mitigate roadways that are unsuitable for bicycles, pedestrians, and transit users.	Immediate
10	Identify proper resources for communities to maintain bridges and culverts under their jurisdiction.	Immediate
11	Actively coordinate with PVTA and PVTA’s Safety Committee on Safety and Security processes and plans as established in the Agency Safety Plan	Ongoing
12	Coordination with the CDC and MEMA on infectious disease response protocols.	Immediate

Table 14-2 - Needs to Enhance the Movement of People (MoP)

1	Integrate complete streets, parking, and connectivity enhancements into transportation improvements.	Ongoing
2	Identify and monitor changes in regional peak hour travel trends.	Ongoing
3	Expand the existing bicycle and pedestrian network.	Ongoing
4	Maintain equity in providing transportation services and access throughout the region.	Ongoing
5	Maintain and increase access to national passenger rail service in the Pioneer Valley.	Ongoing
6	Address the requirements of an aging population in the regional transportation system.	Ongoing
7	Improve coordination, notification, and participation in the review of roadway improvement projects.	Ongoing
8	Secure adequate, dependable, and equitable funding for a balanced regional transportation system that serves both urban and rural areas in the region.	Immediate
9	Increase the use of alternative transportation options to commute to work and school.	Immediate
10	Expand transit options for inter-city, inter-regional passenger trips.	Immediate
11	Expand opportunities for tourism along designated Scenic Byways.	Future
12	Integrate needs identified in the Coordinated Public Transit-Human Services Transportation Plan	Ongoing
13	Integrate PVTA’s annual NTD Inventory and Quadrennial TAM Plan recommendations with TIP Appropriations.	Ongoing

Table 14-3 - Needs to Enhance the Movement of Goods (MoG)

1	Support the development and maintenance of short line and regional railroads.	Ongoing
2	Improve the communication between private carriers and state and local officials.	Ongoing
3	Increase opportunities for air cargo in the region.	Ongoing
4	Provide safe options for short- and long-term truck parking.	Immediate
5	Improve coordination with class one carriers serving the region.	Immediate
6	Consider impacts on freight when making future transportation investments.	Future
7	Improve the reliability of travel on our major roadways and interchanges.	

Table 14-4 - Needs to Enhance the Movement of Information (MoI)

1	Improve distribution and access of real-time highway and transit information.	Ongoing
2	Coordinate efficient use of existing rights of way to house communication infrastructure.	Ongoing
3	Educate communities on the advantages of ITS and expand the use of ITS in the region.	Ongoing
4	Increase opportunities for hybrid public and community involvement in the transportation planning process.	Immediate
5	Improve the availability and quality of high-speed internet and wireless communication access in the region.	Immediate
6	Prepare the regional transportation network for new technology such as autonomous and connected vehicles.	Future

Table 14-5 - Summary of Needs to Enhance Sustainability (S)

1	Protect existing natural, historical, and cultural resources.	Ongoing
2	Encourage travel modes that minimize impacts on air quality, greenhouse gas emissions and energy consumption.	Ongoing
3	Raise the average vehicle occupancy rate for the region.	Ongoing
4	Consider the impacts of large-scale development on surrounding communities.	Ongoing
5	Reduce impervious surfaces and stormwater runoff from roads and highways.	Ongoing
6	Promote transit-oriented development and pedestrian friendly development.	Immediate
7	Reduce visual and light pollution while ensuring pedestrian and bicycle visibility.	Immediate
8	Expand opportunities for electric vehicle charging in the region.	Immediate
9	Incorporate renewable energy into transportation improvement projects and transportation facilities.	Future
10	Reduce sprawl and foster investment in existing urban areas.	Future
11	Provide for fish and wildlife migration and passage in transportation projects.	Future

B. STRATEGIES

Strategies were developed to address the regional needs identified for each emphasis area. These strategies are summarized in Table 14-6 – 14-10. Again, each strategy has been prioritized as either Immediate, Future or Ongoing. Immediate strategies are considered a high priority and must be advanced in the short term. Future strategies are areas of medium importance that should be considered during the development of future projects. Ongoing strategies are typically already included as part of the regional transportation planning process.

Recognizing that regional strategies can address more than one need; a third column has been added to each strategy table to identify the corresponding regional need(s). This column is abbreviated for space considerations and includes the Emphasis Area abbreviation followed by the corresponding need number(s) from Tables 14-1 – 14-5. Each table has also been color coded by Emphasis Area to match Figure 14-1.

Table 14-6 - Safety and Security Strategies

		Priority	Need(s) Addressed
1	Perform regular updates to the Regional Safety Compass to develop a list of high crash locations and summarize historic crash experience for all communities, including environmental justice populations.	Ongoing	S&S 1,9
2	Incorporate a Safe System Approach and a vision to achieve zero roadway fatalities and serious injuries strategies in all regional safety planning activities.	Ongoing	S&S 1, S 7
3	Work with appropriate agencies to improve the consistency of crash records and reporting to assist in identifying the contributing factors to crashes, fatalities, and incapacitating injuries.	Ongoing	S&S 1
4	Provide infrastructure improvements to support pedestrians, transit users, and bicyclists in roadway and bridge design and the maintenance of existing facilities. Promote connectivity as part of all transportation improvement projects.	Ongoing	S&S 1,9
5	Implement communications and ITS technologies to improve vehicle safety, public transit safety, and security.	Ongoing	S&S 2,6
6	Perform regular updates of critical regional transportation choke points, haz-mat routes, and users.	Ongoing	S&S 5,7
7	Promote the Massachusetts Complete Streets and Safe Routes to School programs.	Ongoing	S&S 1,8,9
8	Promote and advance the use of Roadway Safety Audits and Vulnerable Road User Assessments in the Pioneer Valley.	Ongoing	S&S 1
9	Work with emergency responders to update regional evacuation plans.	Ongoing	S&S 4
10	Identify and advocate for additional revenue sources to bring the regional transportation system into a state of good repair.	Immediate	S&S 10, MoP 8
11	Improve intersection geometry and upgrade traffic signal control equipment to improve safety. Consider roundabouts as alternatives to new traffic signals.	Immediate	S&S 1
12	Develop appropriate educational resources to promote safety for drivers, bicyclists, transit users, and pedestrians.	Immediate	S&S 1,8
13	Review and upgrade safety and security infrastructure for regional freight rail facilities.	Immediate	S&S 3
14	Coordinate with MassDOT, FTA and PVTA's safety and security response policies as identified in the Agency Safety Plan; actively review public transit safety concerns brought forward by PVTA Administration.	Ongoing	S&S 11
15	Work with FTA, MEMA and the PVTA to implement regional infectious disease response protocols.	Immediate	S&S 12

Table 14-7 - Strategies to Assist in the Movement of People

		Priority	Need(s) Addressed
1	Seek innovative methods to increase transit ridership, including express routes and flex vans.	Ongoing	MoP 6,8,9 S 2,3,6
2	Monitor congested areas using the regional Congestion Management Process (CMP).	Ongoing	MoG 7, MoP 2
3	Develop a regional list of top congested corridors and bottlenecks.	Ongoing	MoP 2
4	Promote the implementation of separated bicycle lanes and shared use paths.	Ongoing	MoP 3
5	Advance and promote the principles of pavement management. Invest in the repair and maintenance of existing transportation infrastructure.	Ongoing	MoP 8
6	Assess connectivity for all modes of transportation for downtown areas and village centers. Identify locations for park and ride lots and supporting express transit service.	Ongoing	MoP 1,3,9,10 S&S 9
7	Work with local communities to incorporate the concepts of Complete Streets and Traffic Calming into transportation improvement projects.	Ongoing	MoP 1,3 S&S 9
8	Assess the equity of regional transportation services and projects in the RTP, TIP, UPWP and planning studies.	Ongoing	MoP 4 Mol 4,5
9	Incorporate Transportation Alternatives eligible components into transportation improvement projects. Identify areas for new rest areas and rest stops.	Ongoing	MoP 11 MoG 4
10	Support MassDOT and local communities in the use of online tools such as GeoDOT and the MaPIT.	Ongoing	MoP 7 Mol 4
11	Develop a comprehensive Commuter Rail network.	Immediate	MoP 5,10 S 2,3,6
12	Advocate for better collaboration and coordination between all transportation service providers to allow for more opportunities to provide connections between existing services.	Immediate	MoP 4,5,10
13	Identify sources of revenue for local transportation projects.	Immediate	MoP 8
14	Promote compact "Village Center" development to include senior and low-income housing, access to healthy food and medical services via a variety of modes of transportation.	Future	MoP 3,6
15	Encourage private connections to the regional bikeway network.	Future	MoP 3
16	Ensure adequate resources for Public Transit as determined by PVRTA using the Annual NTD Inventory and Quadrennial TAM Plan	Ongoing	MoP 12,13

Table 14-8 - Strategies to Enhance the Movement of Goods

		Priority	Need(s) Addressed
1	Enhance directional and guide signs to/from the regional highway system and major destinations.	Ongoing	MoG 1
2	Meet with class one carriers on a regular basis to enhance the regional freight rail network.	Ongoing	MoG 2,5
3	Incorporate appropriate design measures in roadway improvement projects to accommodate freight movements.	Ongoing	MoG 2,6
	Perform data collection at truck rest stops to identify demand.	Ongoing	MoG 4
4	Improve the connections between the national highway network and air and rail intermodal terminals, freight yards, and distribution centers.	Immediate	MoG 1,3
5	Develop incentives to encourage businesses to utilize a mix of freight transportation alternatives.	Immediate	MoG 1,3
6	Identify and mitigate vertical clearance issues at underpasses.	Immediate	MoG 6
7	Use the regional CMP to identify areas of freight congestion.	Immediate	MoG 1,2,3,6,7 MoP 2

Table 14-9 - Strategies to Enhance the Movement of Information

		Priority	Need(s) Addressed
1	Encourage the integration of cameras, security devices and other ITS equipment as part of transit and roadway improvement projects.	Ongoing	Mol 1
2	Provide training for local communities and stakeholders to increase their understanding of various ITS technologies and equipment.	Ongoing	Mol 3
3	Ensure consistency with the ITS Regional Architecture for Western Massachusetts.	Ongoing	Mol 1,2,3,6,7
4	Monitor emerging information and communications technologies to stay current with state-of-the-art information systems and identify opportunities for expansion of existing service.	Ongoing	Mol 1,3,7
5	Expand efforts to incorporate more feedback into the regional transportation planning process.	Ongoing	Mol 4,5 MoP 7
6	Continue to refine and improve the regional TEC project prioritization system as necessary.	Ongoing	Mol 3,6 MoP 7
7	Educate local communities on the project development process.	Ongoing	Mol 3,6 MoP 7
8	Encourage and promote telecommuting and video conferencing.	Ongoing	Mol 5 S 2
9	Expand real-time passenger and travel information systems for all travel modes.	Ongoing	Mol 1,3
10	Pursue public/private partnerships to reduce cost and enhance information access.	Immediate	Mol 2,5,6
11	Develop and implement regional and local policies on autonomous vehicles.	Immediate	Mol 6
12	Incorporate best practices to accommodate new technology in infrastructure projects.	Future	Mol 6

Table 14-10 - Strategies that Enhance Sustainability

		Priority	Need(s) Addressed
1	Mitigate the adverse impact of sprawl by creating incentives for downtown revitalization, promoting smart growth and mixed-use development.	Ongoing	S 2,3,4,6,8,9
2	Develop regional Best Management Practices for TIP projects to mitigate stormwater impacts. Refer new TIP projects to the Pioneer Valley Sustainability Toolkit.	Ongoing	S 5,7,10
3	Restore or maintain connected habitats that allow for movement of fish, water, and wildlife.	Ongoing	S 1,11
4	Encourage the use of permeable materials and reduce the use of concrete.	Ongoing	S 5
5	Assist local communities with their subdivision needs.	Ongoing	S 4,6,8
6	Designate wild and scenic corridors along highways and streams of historic and natural significance to promote tourism.	Ongoing	S 1 MoP 11
7	Implement the Regional Clean Energy Plan to promote energy efficient travel modes and encourage local fleets to use clean fuels.	Ongoing	S 2,3,8
8	Implement transportation-based strategies identified in local Hazard Mitigation Plans.	Ongoing	S 1
9	Encourage the planting of shade trees in urban areas and along shared use paths to improve air quality and modulate extreme weather conditions.	Ongoing	S 6
10	Work with major employers to develop incentives to decrease single occupant vehicle use.	Immediate	S 2,3,4,8,9
11	Mitigate the impacts of roadway salt and chemical usage during snow season.	Immediate	S 1
13	Incorporate energy efficient lighting, solar power, and electric vehicle charging stations as part of transportation improvement projects.	Immediate	S 7,8,9
14	Improve education and enforcement of idling reduction programs to reduce greenhouse gas emissions.	Immediate	S 1,2
15	Identify potential climate hazards and create resilient roadways that are less susceptible to flooding and drought.	Immediate	S 1
16	Prohibit billboards and screen lighting on highways.	Future	S 7

C. PROJECTS

Beginning in the 2020 RTP and continuing in the 2024 RTP, the projects section was reorganized to provide greater clarity. In previous versions of this document, every approved project as well as any future project believed to be ready for construction within the life of the plan was identified in this section. Instead, PVPC has identified three types of projects to be discussed in this section:

- Projects included in the 2024-2028 Transportation Improvement Program (TIP) [Click Here to View](#)
- Major Regional projects (Table 14-12)
- Visionary projects (Table 14-13)

Major regional projects are defined as projects with an inflated cost greater than \$20 million or exceeding half regional target funds and will take multiple years to be constructed. This qualifies the project funding to be advanced constructed (A/C). AC funding a project allows funds to be spent in each TIP year the project will be under construction. Visionary projects include any project that either does not fit into financial constraint due to cost and/or a priority project that may not be ready to construct during the lifetime of this plan. Chapter 15 of the RTP provides additional information on the anticipated transportation revenue over the life of the plan and the regional scenario for how transportation funding can be allocated by project type.

1. Project Priority Criteria and Selection

In 2014 PVPC with the assistance of the Joint Transportation Committee (JTC) completed a comprehensive update to the Transportation Evaluation Criteria (TEC) for the PVMPO. The purpose of the update was to bring the TEC up to the latest federal requirements. In 2018, PVPC staff with the assistance of the JTC reviewed the effectiveness of the TEC to ensure the criteria were working as anticipated and met the requirements of the FAST Act. In the Fall of 2022 PVPC staff completed its third internal review of the TEC. The purpose of this review was to ensure that the TEC was in compliance with the Bipartisan Infrastructure Law (BIL). The MPO approved multiple TEC changes in the month of December in preparation for the development of the FFY 2024-2028 TIP. All projects included in the TIP have been evaluated and assigned a priority rating using the TEC scoring as adopted by the MPO. This process is used as a management tool to identify projects of regional priority and program them in the TIP. Table 14-11 provides a [summary of the TEC scoring](#).

Table 14-11 - TEC Scoring Summary

System Preservation, Modernization and Efficiency	Livability	Mobility	Smart Growth and Economic Development	Safety and Security	Environment and Climate Change	Quality of Life	Environmental Justice and Title VI
Improves Substandard Pavement 8	Design is consistent with Complete Streets policies 3	Improves efficiency, reliability and attractiveness of public transit 4	Encourages development around existing infrastructure 2	Reduces number and severity of collisions 7	Preserves floodplains and wetlands 1	Enhances or preserves greenways and blueways 1	Reduces and limits disproportionate impacts on an EJ community 0.5
Improves Intersection Operations 6	Provides multi-modal access to a downtown, village center, or employment center 2	Improves existing peak hour LOS 6	Prioritizes transportation investments that support land use and economic development goals 1	Promotes safe and accessible pedestrian and bike environment 4	Promotes green infrastructure and low impact development to reduce stormwater impacts 2	Improves access to parks, open lands and open space 1	Reduces and limits disproportionate impacts on Title VI community 0.5
In a Congestion Management Process Area 7	Enhance non motorized transportation 1	Reduces traffic congestion 5	Provides services to a TOD, TND or cluster development district 0.5	Improves emergency response 4	Reduced impervious surfaces 0.5	Improves access to jobs 2	Improves transit for EJ populations 1
	Project serves a targeted development site 2		Supports mixed-use downtowns and village centers 0.5		Protects or enhances environmental assets 0.5	Preserves historical and cultural resources 0.5	Improves transit for Title VI populations 1
	Completes off-road bike and ped network 3		Improves Intermodal Connections 4		Supports Brownfield redevelopment 0.5	Preserves prime agricultural land 0.5	Creates an EJ Burden -5
			Reduces congestion on freight routes 2		Improves air quality 2	Provides safe and reliable access to education 0.5	Creates an Title VI Burden -5
					Improves fish and wildlife passage 1	Supports designated scenic byways 0.5	Public Involvement with Impacted Underserved Communities 1
					Supports Green Communities 0.5	Implements ITS Strategies 1	
					Improves storm resilience 3	Improves Network Wayfinding 1	
					Carbon Reduction Program 0.5	Access to Sensative Receptors 1	
					Project Improves Habitat Connectivity 1	Length of Time Project has been in queue for TIP funding 1	
						Construction of Rest Areas 0.5	
Maximum Score	21	12	15	10	15	12.5	10.5
							4

2. Development of the FY2024 – FY2028 TIP

As the lead planning agency for the MPO, PVPC accepts the responsibility for developing the TIP in a cooperative process with members of the MPO and the general public. The final TIP is voted on for endorsement at a formal meeting of the MPO. The endorsed TIP project listing is included in the State Transportation Improvement Program (STIP) and requires endorsement by the Governor.

The MPO relies on a transportation advisory committee, the JTC, to carry out the cooperative process during TIP development. The JTC is a group of community appointed officials, MPO member representatives, public and private transportation providers, citizens, and special interest groups and agencies. The JTC establishes and recommends to the MPO procedures for submitting, prioritizing, and selecting projects for the TIP. PVPC staff provides the technical support to conduct the TIP development activities for the JTC.

Transportation improvement projects included as part of the FY2024 – FY2028 TIP for the Pioneer Valley MPO must come from a conforming regional transportation plan. Projects included in the FY2024 – FY2028 TIP conform to the 2020 RTP and are presented in this plan for informational purposes. A summary of these projects can be found at [2024 – 2028 Transportation Improvement Program \(TIP\) – Pioneer Valley Metropolitan Planning Organization \(pvpc.org\)](https://www.pvpc.org/2024-2028-Transportation-Improvement-Program-TIP).

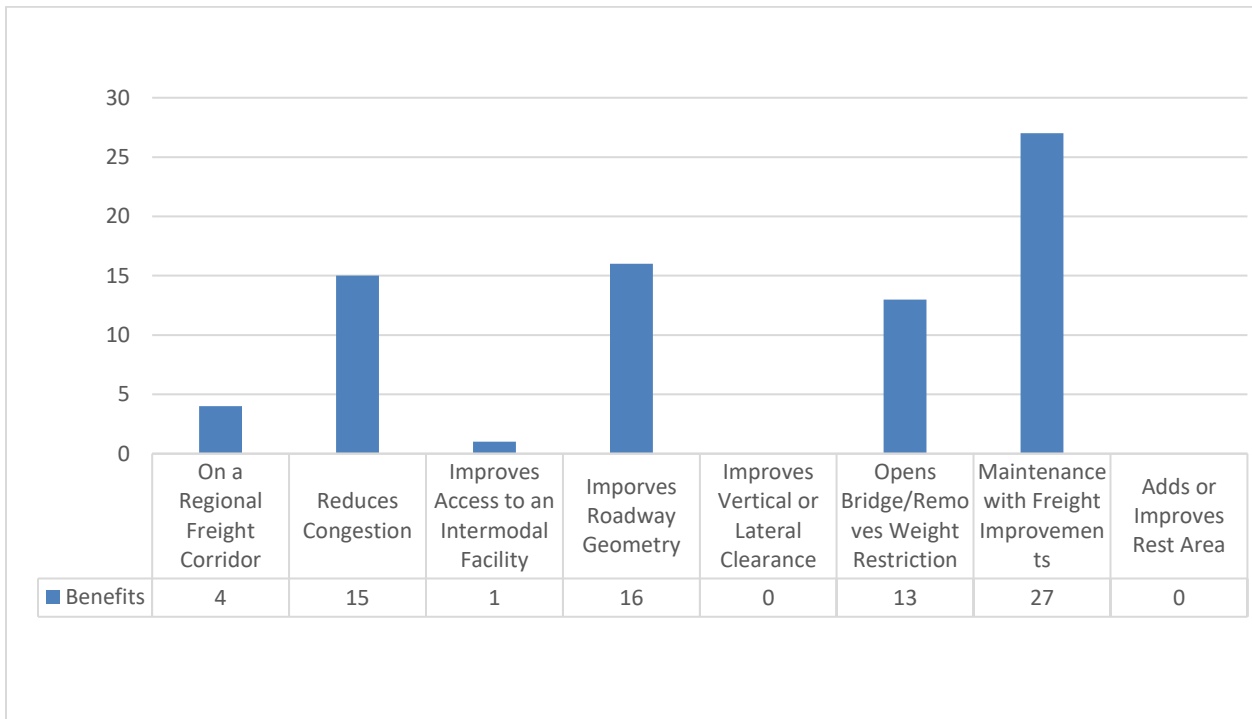
3. Freight Impacts of Transportation Projects

PVPC reviewed all known RTP projects to identify the potential freight benefits of each project. Staff used the methodology outlined in the [Regional Freight Plan](#) for this analysis. Eight freight benefits were identified:

- The project is located on a designated critical freight corridor.
- The project is expected to reduce roadway congestion.
- The project improves access to an intermodal facility.
- The project improves existing roadway geometry.
- The project improves vertical or lateral clearance.
- The project opens an existing closed bridge or removes an existing weight restriction.
- The project includes roadway maintenance improvements that will benefit freight.
- The project adds or improves a rest area.

99 projects were reviewed with 52 projects having at least one element that could benefit the movement of freight through the region. Figure 14-2 summarizes the number of projects by the potential freight benefits.

Figure 14-2 - Freight Benefits of Proposed Transportation Improvement Projects



A total of twenty-seven projects are expected to include maintenance improvements such as roadway reconstruction that would have a positive impact for freight. Sixteen projects are expected to result in improvements to existing roadway geometry that would be beneficial for freight movements. Fifteen projects are expected to reduce existing congestion. Thirteen projects identified are located on a bridge with weight restrictions. Only four projects are located on an existing critical freight corridor. In addition, very few projects are expected to improve access to an intermodal center. No projects are currently proposed to address vertical clearance issues or to improve rest areas in the region.

4. Major Regional Projects

Major regional projects are defined as a project with an inflated project cost that exceeds \$20,000,000 or exceeds half regional target funds and will take multiple years to be constructed which qualifies the project funding to be advanced constructed (A/C). AC funding a project allows for the funds to be spent in each year that the project will be under construction. Over the next 5 years, there are several projects meeting the Major Regional Project definition, these projects are at various stages of design. These projects are competing with the complete backlog of projects for regional target funds. The PVMPO programs approximately \$32,000,000 in regional target funds per federal fiscal year. On average the PVMPO funds less than 5 roadway projects per fiscal year. It is difficult to commit over half of regional target funds each year to a single project which would result in less projects

advancing through the TIP process. Having the ability to AC projects with larger cost allows the MPO to spend most of the regional discretionary funds yearly. As a result, the MPO is able to advance the high scoring projects much quicker to through the TIP process. The Major Regional Projects are listed in Table 14-12

Table 14-12 - Major Regional Projects

Municipality	SID	Project Name and Description	Design	TEC Score	Programmed	4% Inflation
Williamsburg	608787	CONSTRUCTION OF THE "MILL RIVER GREENWAY" SHARED USE PATH	0	29.0	2028 - 2029	\$40,000,000
System Wide		PVTA FULL SYSTEM ELECTRIFICATION: INCLUDING BUSES, CHARGES, SOLAR PANELS, AND SUPPORT EQUIPMENT – PHASE 1	Phase 1 2024		2024 RTP	\$57,000,000
Springfield	608717	RECONSTRUCTION OF SUMNER AVENUE AT DICKINSON STREET AND BELMONT AVENUE (THE "X")	75	70.5	2024	\$19,966,867
Northampton	609286	DOWNTOWN COMPLETE STREETS CORRIDOR AND INTERSECTION IMPROVEMENTS ON MAIN STREET (ROUTE 9)	25	75.5	2025	\$19,661,701
Easthampton	612258	DOWNTOWN COMPLETE STREETS IMPROVEMENTS ON MAIN AND NORTHAMPTON STREETS (ROUTE 10)	0	57.5	2027	\$16,621,659
						\$153,250,227

5. Visionary Projects

Visionary Projects are defined as projects that would likely result in an improvement to the regional transportation system but do not have an identified source of construction funding. Visionary projects are not included as part of the Financial or Air Quality Conformity components of the RTP. The RTP will need to be amended to include any identified visionary projects as funding becomes available in order to demonstrate financial constraint and conformance with the requirements of the Clean Air Act Amendments.

Table 14-13 - Visionary Projects

Project Type	Project Description	Estimated Cost
Region wide - High Speed Rail	East/West high speed rail Capital entire system -Boston to Springfield to Vermont/Canada Line	\$785,000,000
Northampton Intermodal Facility	Northampton Intermodal Facility	TBD
I-91 Viaduct Improvements - Pref. Alt (No Build)	All recommendations except near term bicycle and pedestrian improvements	\$827,350,000.00
Full System Electrification	PVTA Full System Electrification: Including buses, charges, solar panels, and support equipment	\$162,000,000

* These estimated costs assume some level of inflation but not at the federally required 4%/year.

a) I-91 Viaduct - Springfield

The Interstate 91 Viaduct Study was initiated by MassDOT to study alternatives for the future replacement of the elevated portion of the Interstate 91 in the city of Springfield. This study, completed in 2018, developed a series of conceptual alternatives that focus on potential structural changes to the I-91 Viaduct as well as improvements to improve safety and efficiency along the I-91 corridor. A copy of the full study is available at: [MassDOT Completed Studies | Mass.gov](#)-. All total, four alternatives, including a “no-build” alternative, were presented for consideration.

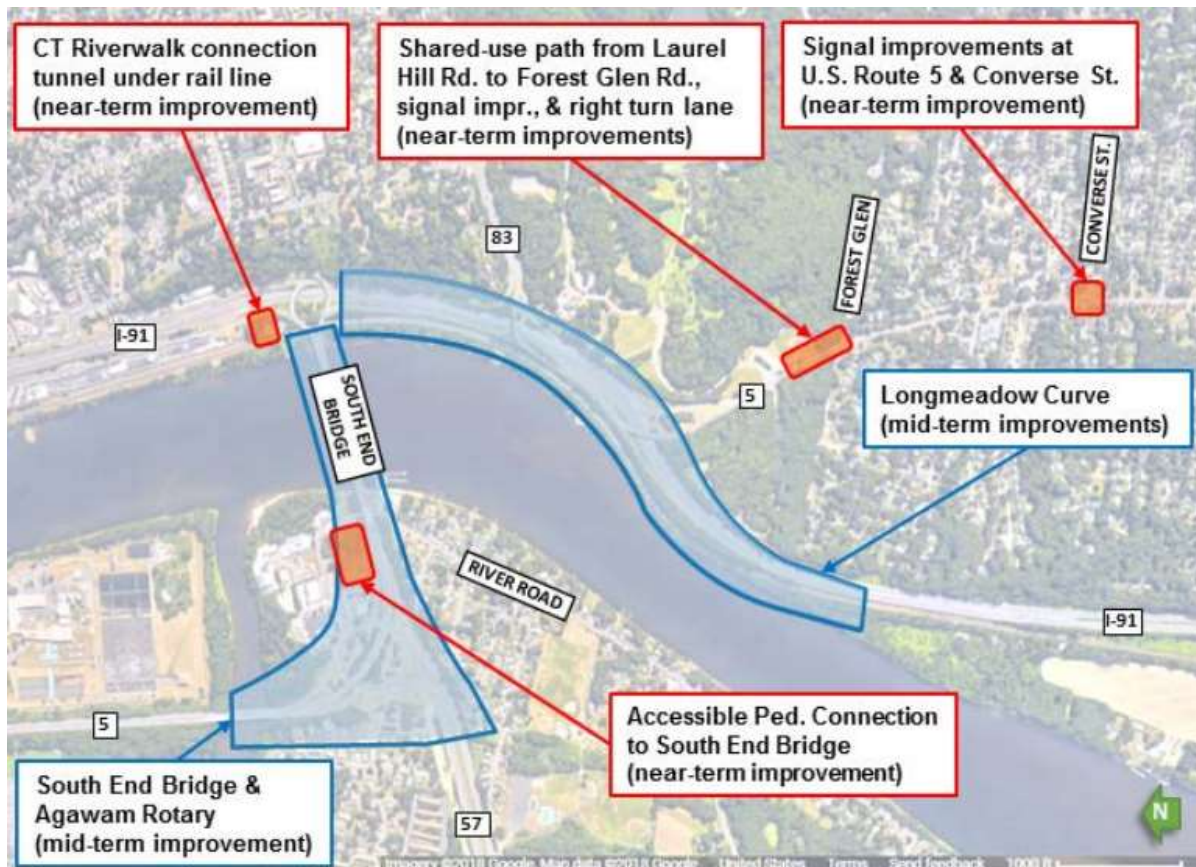
- Alternative 1 – Depressed Section of I-91 with Same Alignment
- Alternative 2 – Depressed Section of I-91 with New Alignment
- Alternative 3 – Elevated Viaduct
- No Build

At the conclusion of the study, the “No Build” alternative was viewed as the most beneficial long term improvement option for the I-91 Viaduct. The No Build alternative still had several near and mid-term improvement recommendations to improve safety and enhance the efficiency of the I-91 Corridor. Most near-term improvement recommendations consisted of enhancements to the bicycle and pedestrian network that would typically be included as part of the ongoing roadway maintenance. Proposed near and mid-term improvements for the southern section of I-91 are shown in Figure 14-3. Near-term improvements are summarized on pages 13 – 15 in Chapter 5 of the I-91 Viaduct Study.

Mid-term improvements consist of projects to improve safety along the existing curve on I-91 through Longmeadow, improvements to the existing ramps to Route 5 in Longmeadow, enhancements to the South End Bridge between Springfield and Agawam, and elimination of the existing Route 5/57 rotary in Agawam. All of the above projects are extremely beneficial but are not included in the financially

constrained portion of the RTP due to their projected cost. Additional resources will need to be identified by MassDOT to advance these projects to construction.

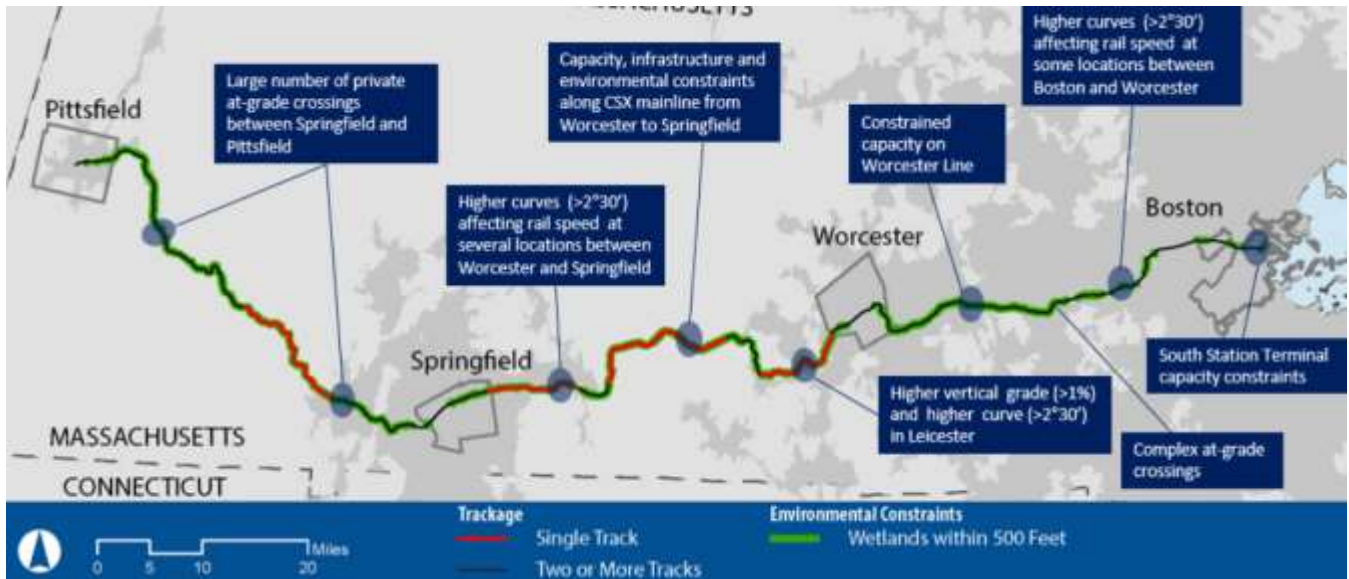
Figure 14-3 - Near and Mid-Term Improvements I-91 South Section



b) East-West Passenger Rail Study

Passenger rail service from Boston to Springfield and Pittsfield is currently under study by MassDOT. The study will examine the costs, benefits, and investments necessary to implement passenger rail service at a speed and frequency to be a competitive travel option along this corridor. More information can be found on the study website: <https://www.mass.gov/east-west-passenger-rail-study>.

Figure 14-4 - Key Constraints Along the Rail Corridor



While we believe it is important to advance east/west passenger rail service for the region to Boston, the project cannot be included as part of the financially constrained portion of the RTP until a formal recommendation is made through the study.

c) PVRTA System Electrification

In FFY 2023 PVRTA was awarded a \$54 million [Low/No 5339 Grant](#) for the purpose of electrifying and modernizing the system. The first phase, which is being funded in FFY 2024, includes the electrification of the Cottage Street facility, buses and chargers, staff training, and the installation of solar panels. The visionary component of this project includes the electrification of both the UMass and Northampton facilities as well as the full conversion away from diesel buses to a fully electric fleet. The estimated timeline for completion of the full system electrification is over the next ten years and is dependent on applying for additional funding above what PVRTA currently receives on an annual basis.

D. RTP PROBLEM STATEMENTS

Problem statements were originally developed as part of the 2016 RTP to identify the potential obstacles to achieve the region's Vision for the transportation system. The problem statements were revisited and updated as part of the 2024 RTP in relation to the updated vision and goals. Problem statements are concise descriptions of the overarching issues that must be addressed through the implementation of the RTP. Problem statements were developed based on the input received during the RTP focus group and outreach process conducted during the fall and winter of 2022. Ten problem statements are summarized below.

1. Existing resources are insufficient to support the state of good repair of the regional transportation system and do not properly compensate for inflation.
2. There is an urgent need to decrease the number of motor vehicle crashes that result in a serious injury or fatality, particularly for bicyclists and pedestrians.
3. Existing passenger rail and transit service does not meet the needs of residents of the Pioneer Valley. Expanded passenger rail and transit connectivity, particularly to eastern Massachusetts, is integral to education, economic development, and workforce development.
4. There is a need for innovative, cost-effective intermodal connections, independent of the regional transit authorities, that support and enhance transportation options for downtown areas, village centers, and rural areas.
5. Increased and comprehensive resources and policies to improve sustainability in the transportation sector are necessary if the region is to meet its fair share of national and state greenhouse gas reduction goals.
6. The built environment for walking, bicycling and transit is hampered by significant barriers that include narrow road and bridge cross sections, disjointed/unconnected off-road trail networks, a lack of sidewalks, uniformity in signs/markings, transit access points and maintenance issues.
7. The regional transportation system is not prepared to adequately support future change. The system must be prepared for the safe and seamless integration of concerns such as autonomous vehicles, electric vehicle charging infrastructure, and climate change.
8. People use the regional transportation system differently based on their age, ability, income, occupation, and residence. The regional transportation system must continue to evolve to safely meet the needs of all.
9. There are inconsistencies in how cities and towns regulate development and their requirements to reduce single occupant vehicle use and encourage alternative forms of transportation.
10. The regional transportation infrastructure, particularly a lack of dedicated freight parking, hinders the movement and distribution of freight.

1. Existing resources are insufficient to support the state of good repair of the regional transportation system and do not properly compensate for inflation.

In short, there are not enough resources to fund all the necessary improvements to keep the transportation system in a state of good repair. One obstacle is the disconnect between transportation revenue and the rising cost of transportation improvements. The 2024 RTP assumes an average 2.5% per year increase in transportation revenue versus a 4% per year increase in the cost of transportation projects. This is not sustainable. The rising cost of transportation improvement projects has resulted in many projects being pushed back into future years for construction. It also results in the development of several phased projects that can be constructed at a more manageable cost. Ultimately, this is a poor use of transportation funds as any cost savings in the short term are offset by inflated long-term project costs.

On the national scale, the federal Highway Trust Fund is not able to keep pace with the current pace of transportation spending. The current federal tax is 18.4 cents per gallon for gasoline. In contrast, the current tax per gallon of gasoline in Massachusetts is 24 cents per gallon.

At the local level, communities rely on Chapter 90 funding to advance necessary maintenance projects. This funding is critical to maintain local roads which are not eligible for federal transportation dollars. The Massachusetts Municipal Association estimated that a total of \$715 million would be required in fiscal year 2024¹¹ to keep roadways in a state of good repair. For 11 years, the Chapter 90 program has been mostly level-funded at \$200 million. During this same time, the cost of road construction and maintenance has increased by 65.7%.¹²

2. There is an urgent need to decrease the number of motor vehicle crashes that result in a serious injury or fatality, particularly for bicyclists and pedestrians.

The National Highway Traffic Safety Administration (NHTSA) reported a 10.5% increase in motor vehicle traffic crashes that resulted in a fatality from 2020 to 2021¹³. In Massachusetts the increase was 21.8%. In the Pioneer Valley Region, the increase was 30%¹⁴. These grim statistics are in contrast to the declines in driving experienced during the COVID-19 pandemic. It is important that we begin to prioritize that motor vehicle fatalities and serious injuries are unacceptable and preventable.

FHWA advocates for a [Safe System Approach](#) to place safety first in roadway investment decisions. MassDOT incorporated both the Safe System Approach

¹¹ [MMA urges Transportation Committee to increase Ch. 90 to \\$330M per year to help maintain local roads - Massachusetts Municipal Association \(MMA\)](#)

¹² IBID

¹³ [NHTSA's 2021 Estimate of Traffic Deaths Shows 16-Year High](#)

¹⁴ Source: MassDOT

and a vision to achieve zero roadway fatalities and serious injuries as part of their [Strategic Highway Safety Plan](#) (SHSP). The Pioneer Valley MPO is committed to the implementation of the principles of the Safe System Approach and the Massachusetts SHSP. The FFY 2024 Unified Work Program (UPWP) includes a new task to identify prime locations for in-depth analyses to improve non-motorist safety. This task will build on planning efforts such as the [Safety Compass](#) to advance a commitment to safety for all roadway users.

3. Existing passenger rail and transit service does not meet the needs of residents of the Pioneer Valley. Expanded passenger rail and transit connectivity, particularly to eastern Massachusetts, is integral to education, economic development, and workforce development.

There is a strong desire to expand passenger rail service in the region. Results from the RTP Public Outreach survey show that over 50% of respondents would ride the train monthly if the frequency of rail service was increased between the Pioneer Valley and Boston. Another 14% responded they would ride the train on a weekly basis.

Most trains in Springfield operate south to New Haven as either Amtrak or *CTRail* trains. There are 13 departures and 13 arrivals on weekdays on this route. In 2022 MassDOT committed to permanently operate the *Valley Flyer* between Greenfield and New Haven. Ridership on the *Valley Flyer* is strong with the most travelled city pair being Northampton and New York city.

PVPC has been actively engaged in advocating for additional passenger rail service to Boston to expand on the one daily trip per day currently provided. PVPC participated in a MassDOT initiated study of East/West rail that recommended up to ten additional trips/day between Springfield and Boston. In addition, the Massachusetts State Legislature has established a Western Mass Passenger Rail Commission that includes the PVPC Executive Director. Recommendations from the Commission are expected later in 2023. Both Amtrak and the Massachusetts State Senate have identified opportunities for expanded passenger rail service in the Pioneer Valley.

The expansion of intercity passenger rail has the potential to be a major component in producing economic revitalization, spurring job creation, improving air quality, increasing overall mobility and reducing vehicular traffic congestion. This requires an investment in the development and maintenance of rail infrastructure, modern stations and pricing that encourages ridership.

4. There is a need for innovative, cost-effective intermodal connections, independent of the regional transit authorities, that support and enhance transportation options for downtown areas, village centers, and rural areas.

Intermodal transportation facilities encourage the use of alternative transportation modes through the coordination of a variety of transportation modes at a strategic location. Amenities such as waiting areas, restrooms, and food service may also be provided. Larger facilities are often incorporated into developments that may include residential units as well as retail and office space. It is also important to provide connecting infrastructure such as sidewalks and bicycle lanes to allow people to safely walk or bike to the facility. A strong multimodal transportation system must be developed in coordination with complementary land uses at a level that is appropriate for the respective community.

Transit service can be difficult in rural areas that may not have the population density to support traditional fixed route transit services. Innovation is the key in the development of new rural transit service. This can consist of the identification of overlapping duplicative services, adaptation of existing underutilized services, and the development of partnerships with local business to provide new services. It will be important to continue to work with the Regional Coordinating Councils, the existing transportation providers, and human service providers to identify opportunities to develop cost effective and replicable models to serve village centers and rural areas in the Pioneer Valley.

5. Increased and comprehensive resources and policies to improve sustainability in the transportation sector are necessary if the region is to meet its fair share of national and state greenhouse gas reduction goals.

Federal Planning Emphasis Areas (summarized in Chapter 2) require the RTP to advance strategies that help achieve the national greenhouse gas (GHG) reduction goals of 50-52 percent below 2005 levels by 2030, and net-zero emissions by 2050. On December 21, 2022, in compliance with the Global Warming Solutions Act as amended by “An Act Creating A Next-Generation Roadmap for Massachusetts Climate Policy”, adopted statewide GHG limits as well as sector specific sublimits for 2050. The statewide limit was also set as net zero GHG emissions by 2050.

The Massachusetts [Clean Energy and Climate Plan for 2050](#) outlines strategies to improve public transportation and invest in housing and multimodal transportation infrastructure. The goal is to help residents travel without a personal vehicle when possible while achieving decarbonization through the electrification of vehicles. New vehicle emission standards require auto manufacturers to produce an increasing number of zero-emission vehicles. All new passenger vehicles, and the majority of new medium- and heavy-duty vehicles sold in Massachusetts must be electric by 2035. This requires significant upgrades to the energy grid to support the demands of an expanded electric

vehicle fleet. It also requires expansion of the existing network of electric vehicle charging stations.

PVPC will continue to assist regional communities in municipal vulnerability preparedness, advocate for certified “Green Communities” and implement the region’s smart growth plan, Valley Vision. This work is vital to foster change and promote energy efficient modes of transportation such as walking, biking and using the bus.

6. The built environment for walking, bicycling and transit is hampered by significant barriers that include narrow road and bridge cross sections, disjointed/unconnected off-road trail networks, a lack of sidewalks, uniformity in signs/markings, transit access points and maintenance issues.

It is important to provide for the needs of pedestrians, bicycles and transit riders as part of the regional transportation network. The challenge lies in balancing the needs of the maintenance of the existing infrastructure while continuing to expand connections to the pedestrian, bicycle and transit network in a logical manner.

PVPC advocates for a “Complete Streets” approach as part of its transportation planning activities. A “Complete Street” improves livability by improving public safety, increasing usable public space, and making it easier for all modes of travel to share the street. It also creates a more welcoming environment for local businesses.

The identification of gaps in the regional transportation system for all users is a critical task to identify and eliminate existing barriers that restrict travel options. Proper maintenance ensures the continued expansion of a complete transportation system that enhances options for all travel modes in the future.

7. The regional transportation system is not prepared to adequately support future change. The system must be prepared for the safe and seamless integration of concerns such as autonomous vehicles, electric vehicle charging infrastructure, and climate change.

Changes in technology have the ability to greatly improve the safety and efficiency in which vehicles operate. This, however, requires the appropriate physical and informational infrastructure to fully support the new technology. It will be important to continue to incorporate the appropriate infrastructure in future transportation improvement projects to support autonomous vehicles, electric vehicles, broadband communications including 5G networks, and ITS infrastructure. Similarly, it will be important to review existing bylaws, ordinances, and motor vehicle laws to ensure they fully and appropriately address new transportation technology.

8. People use the regional transportation system differently based on their age, ability, income, occupation, and residence. The regional transportation system must continue to evolve to safely meet the needs of all.

Our regional transportation system is not intended to be a “one size fits all” model and it is important to recognize that people will have different transportation needs. As a result, it will be important to seek balance in the transportation system to provide modes that support all residents. The “Age Friendly” movement is a way to design a transportation system to allow all people to have access regardless of their age or ability. It will be important to offer affordable, easy to use public transportation options connected to walking and bicycling amenities.

It is critical that as we improve the regional transportation system, we do so fairly and equitably. The regional transportation planning process must be inclusive and provide all that wish to do so, a means to participate. Transportation improvements must be prioritized in a way to increase access to a variety of transportation alternatives that enhance health and wellbeing.

9. There are inconsistencies in how cities and towns regulate development and their requirements to reduce single occupant vehicle use and encourage alternative forms of transportation.

The Pioneer Valley has been a leader with respect to promoting and encouraging smart growth, or development that is targeted where there is existing infrastructure to support it, versus development far away from roads, power lines, water and sewer lines etc. As a result, it will be important to continue to work closely with our member municipalities to adopt and revise as needed their existing bylaws and ordinances to promote development while encouraging the use of alternate forms of transportation.

10. The regional transportation infrastructure, particularly a lack of dedicated freight parking, hinders the movement and distribution of freight.

Trucking is the dominant mode for freight transportation in the Pioneer Valley due to its flexibility to provide both short and long-haul connections to facilities that may lack convenient access to other freight modes. Truck movements are often hindered due to route restrictions because of poor bridge conditions, inadequate vertical clearance, oversized loads, hazardous cargo, and municipal regulations. Many intersections also lack the proper turning radii to safely accommodate truck movements. As a result, it is important to have appropriate design elements in the regional transportation system to accommodate the movement of freight safely and efficiently.

Truck drivers are required to obey strict laws on the number of hours they can operate their vehicle. A lack of convenient, safe truck parking areas encourages truck drivers to take their mandatory rest break in unsafe areas such as along

roadway shoulders and in vacant parking areas. Rest areas along the Massachusetts Turnpike in the Pioneer Valley region do not currently provide marked parking areas for trucks. “Jason’s Law” was established as part of MAP-21 to place a priority on addressing the shortage of long-term parking for commercial motor vehicles. The American Transportation Research Institute identified the expansion of truck parking facilities at public rest areas as a top focus in 2023¹⁵. Identification of areas for long-term truck parking with amenities such as power, air conditioning/heat, and restrooms is imperative.

¹⁵ [ATRI Announces Top Five Research Issues for 2023 | Transport Topics \(ttnews.com\)](https://www.ttnews.com/articles/atri-announces-top-five-research-issues-for-2023)



15. FINANCIAL ELEMENT

Title 23 CFR Section 450.322 and 310 CMR 60.03(9) requires the RTP to be financially constrained. The financial element must demonstrate which projects can be implemented using current revenue sources and which are to be implemented using proposed revenue sources while the existing transportation system is being adequately operated and maintained. Projects can only be programmed up to the congressionally authorized spending amounts in any individual fiscal year.

The estimate of revenue for the region will be highly dependent upon the funding allocated to Massachusetts as part of future transportation bills. Estimates of the projected revenue sources for highway and transit projects have been made based on past historical trends and information available from the estimated apportionment of the federal authorizations contained in the Infrastructure Investment and Jobs (IIJA) Act. Financial constraint will be maintained in the 2024 RTP Update.

A. REVENUE

The overall RTP, and each fiscal year contained herein, is financially constrained to the annual federal apportionment and projections of state resources reasonably expected to be available during the appropriate timeframe. Projections of federal resources are based upon the estimated apportionment of the federal authorizations contained in the BIL, as allocated to the region by the State or as allocated among the various MPOs according to federal formulae or MPO agreement. Estimates used to develop the highway component of the financial plan were developed by

MassDOT. A summary of the projected highway revenue from 2024 – 2050 is presented in Table 15-1.

Table 15-1 - Estimated Regional Highway Funding

Year	Target	Other Statewide	Non-Interstate	NFA Bridge	Interstate	Total All Funding
	10.8099%	10.8099%	13.0542%	10.8099%	8.4544%	
2024-2028	\$175,492,255	\$105,373,706	\$213,788,284	\$177,033,443	\$138,457,482	\$810,145,170
2029-2033	\$209,580,591	\$97,115,574	\$255,352,825	\$211,452,138	\$165,376,272	\$938,877,400
2034-2038	\$226,072,226	\$147,528,281	\$281,400,913	\$233,021,995	\$182,246,011	\$1,070,269,426
2039-2043	\$248,656,462	\$164,590,208	\$309,233,490	\$256,069,549	\$200,271,454	\$1,178,821,163
2044-2048	\$275,960,775	\$180,067,120	\$335,139,652	\$277,521,880	\$217,049,277	\$1,285,738,704
2049-2050	\$118,265,738	\$76,874,117	\$143,077,563	\$118,479,428	\$92,662,511	\$549,359,357
Totals	\$1,254,028,047	\$771,549,006	\$1,537,992,727	\$1,273,578,433	\$996,063,007	\$5,833,211,220

- Federal and state matching funds for the period of 2024 to 2028 reflect current allocations and are inflated 2% per year thereafter, beginning in 2028 per MassDOT.
- Deductions for statewide items that cannot be allocated individually to the MPOs - Central Artery GANs repayment, Planning, and Extra Work Orders/Cost Adjustments, and the Accelerated Bridge Program - are taken from total available funding, leaving an amount for the available federal funding to be allocated in the regional plans.
- Statewide Bridge funding is not included in Table 1, MassDOT did not provide a regional breakout (see Table 15-2).
- Interstate and Non Interstate funding are attributed to our region based upon historic RTP percentages.
- Funding availability for bridges is based upon the Commonwealth's commitment to a Statewide Bridge Program. The bridge program has two components: federal aid and non-federal aid (NFA) eligible.
- Estimated funding for Other Statewide, NFA Bridge, and Regional Target funding is allocated among the MPOs based upon the existing Massachusetts Association of Regional Planning Agencies (MARPA) TIP targets.
- Per MassDOT no GANS repayments will be needed between 2027 and 2031. Any additional revenue gained from the completion of this repayment will be distributed based on MassDOT financial guidance.

Table 15-2 - Estimated Statewide Bridge Funding

Year	Statewide Bridges
2024-2028	\$177,033,443
2029-2033	\$211,452,138
2033-2038	\$233,021,995
2039-2043	\$256,069,549
2044-2048	\$281,988,588
2049-2050	\$120,849,017
Totals	\$1,280,414,729

The estimates of available 5307, 5310 and 5339 transit revenue shown in this RTP were provided in collaboration with PVTA in April of 2023. Information on anticipated farebox and local revenue was developed using the funding total from the most recent data and based on historical data from the PVTA, then aggregated through the life of the RTP. A summary of estimated transit revenue during the 2024-2050 periods is presented in Table 15-3 and 15-4.

Table 15-3 - Estimated Transit Capital Revenue 2024 – 2050

Year / Funds	5307 Federal Urbanized Area Formula	5339 Federal	5310 Federal Elderly & Disabled	RTACAP	Capital Funds
2024-2028	\$90,018,455	\$8,789,935	\$3,256,165	\$32,900,731	\$134,965,286
2029-2033	\$101,144,331	\$9,876,332	\$3,614,343	\$36,967,113	\$151,602,119
2034-2038	\$104,178,661	\$10,172,622	\$4,011,921	\$38,076,126	\$156,439,330
2039-2043	\$107,304,021	\$10,477,801	\$4,453,232	\$39,218,410	\$161,453,464
2044-2048	\$110,523,142	\$10,792,135	\$4,943,087	\$40,394,963	\$166,653,327
2049-2050	\$45,535,534	\$4,446,360	\$2,194,731	\$16,642,725	\$68,819,350
Total	\$558,704,144	\$54,555,185	\$22,473,479	\$204,200,067	\$839,932,876

- 5307 funding has been inflated 3% per year starting in 2025 per PVTA
- 5310 funding has been inflated 2. per year starting in 2025 per PVTA
- 5339 formula funding has been inflated 3.83 per year starting in 2025 per PVTA

- 5339 discretionary funding is a grant-based program awarded yearly based on project merit.
- 5339 formula and 5339 discretionary funds have been combined into one category.

Table 15-4 - Estimated Transit Operating Revenue 2024 – 2050

	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2050	Grand Total
Local Assessments	\$48,208,855	\$54,543,894	\$61,711,310	\$69,820,795	\$69,820,796	\$31,598,380	\$335,704,030
5307 Federal Urbanized Formula	\$90,018,455	\$101,144,331	\$104,178,661	\$107,304,021	\$110,523,142	\$45,535,534	\$558,704,144
5339 Federal	\$8,789,935	\$9,876,332	\$10,172,622	\$10,477,801	\$10,792,135	\$4,446,360	\$54,555,185
5310 Federal Elderly and Disabled	\$3,256,165	\$3,614,343	\$4,011,921	\$4,453,232	\$4,943,087	\$2,194,731	\$22,473,479
Fare box	\$26,832,702	\$39,257,730	\$45,510,469	\$52,759,108	\$61,162,267	\$28,361,533	\$253,883,809
Advertising, other revenue	\$3,164,120	\$4,199,738	\$4,868,648	\$5,644,098	\$6,543,057	\$3,034,078	\$27,453,739
Available Operating Funds for Programming in the RTP	\$180,270,232	\$212,636,368	\$230,453,631	\$250,459,055	\$263,784,485	\$115,170,616	\$1,252,774,387

- Local assessments escalated 2.5% annually as allowed by statute based on previous RTP.
- Federal grant program contributions (5307, 5339, and 5310) escalated 1.5% annually based on previous RTP.
- Farebox revenue estimate based on 2% annual escalation per year per PVTA.
- Advertising and other revenue escalated 3% annually per PVTA starting in 2025.
- Actual RTACAP contracted (and FY2024 contracted numbers are known) were arrived at and entered 2025-2050 used 1% escalation based on previous RTP.

The estimated revenue from both highway and transit sources is summarized in Table 15-5.

Table 15-5 - Total Estimated Revenue 204-2050

Total Estimated Highway Revenue	\$6,232,391,888
Total Estimated Transit Capital Revenue	\$839,932,876
Total Estimated Transit Operating Revenue	\$1,687,442,057
Grand Total	\$8,759,766,821

**Total Estimated Revenue does not include statewide bridge funding, but does include known bridge projects programmed in the FFY 2024-2028 TIP Financial Constraint Process

The Pioneer Valley MPO used the following methodology to populate the Operating and Maintenance Expenditure Tables. Projects were assigned to an estimated construction year based on project readiness, TEC Score, RTP Priority, and project cost unless otherwise specified.

Operating and Maintenance expenditures were developed separately for the areas of Highway and Transit planning. Cost estimates for each of the priority projects included as recommendations of the RTP were assigned a construction year for planning purposes. An inflation factor of 4% per year was applied to each project to reflect anticipated increases in construction materials over the life of the plan. Actual programmed values were used for all projects included as part of the 2024-2028TIP. Each project was assigned to the appropriate federal funding category to correspond with the revenues estimated in Table 15-1. The total cost estimates for each category were then compared to the recommended investment as developed by MassDOT.

1. Regional Target Funding

The PVPC reviewed historic spending by project type to assist in identifying future regional transportation needs. This information is summarized in Table 15-6.

Table 15-6 - Summary of Highway Spending by Project Type 2024 – 2028

Improvement Type	# of Projects	Expenditure	% Maintenance
Roadway Maintenance	10	\$96,543,313	52.8%
Congestion Improvement	2	\$25,287,258	13.8%
Bike Infrastructure	0.5	\$13,112,721	7.2%
Safety	4.5	\$32,574,011	17.8%
Air Quality Improvement	0.5	\$771,213	0.4%
Pedestrian Infrastructure	0.5	\$12,585,108	6.9%
Freight Infrastructure	1	\$1,948,800	1.1%
Total	19	\$1,948,800	100%

- Values based on past 5 year regional discretionary expenditures in the PV Region.

Over the next 5 years it is anticipated that the region will spend 53% (down from 56% in the 2020 RTP) of its transportation improvement dollars on roadway maintenance projects. Table 15-6 shows a break of the projects funded by improvement type. Each improvement type was then weighted to reflect the % the improvement that included maintenance as part of the improvement. This represents the Actual % column in the table. Table 15-6 was presented to our Joint Transportation Committee (JTC) and feedback was provided on how to estimate the

highway needs over the life of the RTP. The MPO reviewed and approved the proposed Regional Discretionary Funding Allocations at the April 25, 2023 meeting. Table 15-7 shows the % of expenditure by project type for our Regional Discretionary funding.

Table 15-7 - Regional Discretionary Funding Project Allocation

2016 RTP	2020 RTP	RTP 2024	Project Type
70%	67%	65%	Roadway Maintenance Projects
12.50%	8%	7.5%	Congestion Improvement Projects
12.50%	12.50%	15.0%	Safety Improvement Projects
1.25	5%	5.0%	Bicycle Improvement Projects
1.25	5%	5.0%	Pedestrian Improvement Projects
2.5	2.5	2.5%	Air Quality Improvement Projects

B. FINANCIAL CONSTRAINT

The Pioneer Valley MPO used the 2024-2028 Transportation Improvement Program (TIP) to populate target projects in the 2024-2028 targets bin. Starting in the 2029-2033 RTP bin, projects were programmed based on TEC score, project readiness, and project cost. Table 15-8 shows the breakdown of any remaining Regional Discretionary dollars for the FY2029-2033, FY2034-2038, FY2039-2043, FY2044-2048, and FY2049-2050 funding periods. This breakdown is based on the 2024 RTP Regional Discretionary Funding Allocation shown in Table 15-7. Table 15-8 gives the distributions of the regional discretionary funds based on available funding.

The estimated available funds for the region must be greater than or equal to the financial needs of the region over the life of the plan in order to maintain financial constraint. As can be seen from Table 15-9 and 15-10, the Pioneer Valley Regional Transportation Plan is financially constrained over the life of the plan.

Table 15-8 - Regional Discretionary Funding Breakdown

	2024 - 2028	2029 - 2033	2034 - 2038	2039 - 2043	2044 - 2048	2049-2050	Totals
Target	\$175,493,789	\$209,580,591	\$226,072,226	\$248,656,462	\$275,960,775	\$118,265,738	\$1,254,029,582
Programmed	\$171,951,299	\$209,580,591	\$226,072,226	\$248,656,462	\$275,960,775	\$118,265,738	\$1,250,487,092
Difference	\$3,542,490	\$0	\$0	\$0	\$0	\$0	\$3,542,490
Roadway Maintenance Projects = 65%	\$96,275,410	\$136,227,384	\$146,946,947	\$161,626,700	\$179,374,504	\$76,872,730	\$797,323,675
Congestion Improvement Projects = 7.5%	\$28,403,503	\$15,718,544	\$16,955,417	\$18,649,235	\$20,697,058	\$8,869,930	\$109,293,687
Safety Improvement Projects = 15%	\$37,951,854	\$31,437,089	\$33,910,834	\$37,298,469	\$41,394,116	\$17,739,861	\$199,732,223
Bicycle Improvement Projects = 5%	\$4,889,608	\$10,479,030	\$11,303,611	\$12,432,823	\$13,798,039	\$5,913,287	\$58,816,398
Pedestrian Improvement Projects = 5%	\$3,430,924	\$10,479,030	\$11,303,611	\$12,432,823	\$13,798,039	\$5,913,287	\$57,357,714
Air Quality Improvement Projects = 2.5%	\$1,000,000	\$5,239,515	\$5,651,806	\$6,216,412	\$6,899,019	\$2,956,643	\$27,963,395
Constraint	\$3,542,490	Constraint	Constraint	Constraint	Constraint	Constraint	Constraint
Total Expenditures	\$171,951,299	\$209,580,591	\$226,072,226	\$248,656,462	\$275,960,775	\$118,265,738	\$1,250,487,092

Table 15-9 - Highway Fiscal Constraint Summary

	2024 - 2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2050	Grand Total
Total Estimated Highway Revenue	1,209,325,838	938,877,400	1,070,269,426	1,178,821,163	1,285,738,704	549,359,357	6,232,391,888
Interstate	138,457,482	165,376,272	182,246,011	200,271,454	217,049,277	92,662,511	996,063,007
Statewide Bridge	217,611,329	0	0	0	0	0	217,611,329
Springfield- W. Springfield- Bridge Replacement, S-24-003=W-21-002, (US-20) Park Ave over Connecticut River	101,160,743	0	0	0	0	0	101,160,743
Springfield- Bridge Replacement, S-24-017, St. James Ave over CSX & S-24-071, St. James Ave over I-291	80,408,596	0	0	0	0	0	80,408,596
NFA Bridge	177,033,443	211,452,138	233,021,995	256,069,549	277,521,880	118,479,428	1,273,578,433
Non Interstate	213,788,284	255,352,825	281,400,913	309,233,490	335,139,652	143,077,563	1,537,992,727
Other Statewide	105,373,706	97,115,574	147,528,281	164,590,208	180,067,120	76,874,117	771,549,006
Target	175,492,255	209,580,591	226,072,226	248,656,462	275,960,775	118,265,738	1,254,028,047
Major Regional Projects Funded with Target Funds							
Springfield- Reconstruction of Sumner Ave at Dickinson St and Belmont Ave (The "X")	12,966,867	0	0	0	0	0	12,966,867
Northampton- Downtown Complete Streets Corridor and Intersection Improvements on Main St (Rte 9)	19,661,701	0	0	0	0	0	19,661,701
Williamsburg- Reconstruction of Mountain St	14,107,596	0	0	0	0	0	14,107,596
Easthampton- Downtown Complete Streets Improvements on Main and Northampton Streets (Rte 10)	15,621,659	0	0	0	0	0	15,621,659
Williamsburg – Construction of the "Mill River Greenway" Shared Use Path (608787)	20,658,059	23,352,341	0	0	0	0	44,010,400
Total of Programmed Highway Projects in the 2024 RTP	1,205,783,348	938,877,400	1,070,269,426	1,178,821,163	1,285,738,704	549,359,357	6,232,391,888
Difference	3,542,490	0	0	0	0	0	3,542,490

Table 15-10 - Transit Fiscal Constraint Summary

Estimated Transit Operating Funds 2024 - 2050							
	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2050	Grand Total
Local Assessments	\$48,208,855	\$54,543,894	\$61,711,310	\$69,820,795	\$69,820,796	\$31,598,380	\$335,704,030
5307 Federal Urbanized Formula	\$90,018,455	\$101,144,331	\$104,178,661	\$107,304,021	\$110,523,142	\$45,535,534	\$558,704,144
5339 Federal	\$8,789,935	\$9,876,332	\$10,172,622	\$10,477,801	\$10,792,135	\$4,446,360	\$54,555,185
5310 Federal Elderly and Disabled	\$3,256,165	\$3,614,343	\$4,011,921	\$4,453,232	\$4,943,087	\$2,194,731	\$22,473,479
Fare box	\$26,832,702	\$39,257,730	\$45,510,469	\$52,759,108	\$61,162,267	\$28,361,533	\$253,883,809
Advertising, other revenue	\$3,164,120	\$4,199,738	\$4,868,648	\$5,644,098	\$6,543,057	\$3,034,078	\$27,453,739
Available Operating Funds	\$180,270,232	\$212,636,368	\$230,453,631	\$250,459,055	\$263,784,485	\$115,170,616	\$1,252,774,387
Estimated Transit Capital Funds 2024 - 2050							
	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2050	Grand Total
RTACAP	32,900,731	36,967,113	38,076,126	39,218,410	40,394,963	16,642,725	204,200,067
5307	90,018,455	101,144,331	104,178,661	107,304,021	110,523,142	45,535,534	558,704,144
5310	3,256,165	3,614,343	4,011,921	4,453,232	4,943,087	2,194,731	22,473,479
5339	8,789,935	9,876,332	10,172,622	10,477,801	10,792,135	4,446,360	54,555,185
Available Capital Funds	134,965,286	151,602,119	156,439,330	161,453,464	166,653,327	68,819,350	839,932,876
Total Programmed Transit Funding	315,235,518	364,238,487	386,892,961	411,912,519	430,437,811	183,989,966	2,092,707,262
Difference	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -

State Contract Assistance is funding determined each year by the Massachusetts Legislature through coordination with MassDOT. This funding is used to support each region’s Transit Authority. The following identifies the historical level of funding received by PVRTA with a suggested percentage of growth. The MPO is hopeful that such growth will occur based on the findings associated with the RTA Task Force.

Table 15-11 - Estimated State Contract Assistance 2024-2050

FFY Bins	SCA Funds
2024-2028	\$134,433,736
2029-2033	\$164,473,577
2034-2038	\$200,107,256
2039-2043	\$243,461,074
2044-2048	\$296,207,623
2049-2050	\$144,152,746
Grand Total	\$1,182,836,011

C. NEEDS

1. Operating and Maintenance

a) Highway Needs

The values in Table 15-12 are based on the 80% plus Fair Share scenario discussed in the alternative funding section of this chapter. 80% of the funding identified as Non Interstate, Other Statewide, Target, plus the Fair Share funds were summed and then portioned based on the Regional Discretionary Funding Allocation discussed previously in this chapter and shown in Table 15-7. The estimated highway needs were summarized in five-year increments (Bins) and are shown in Table 15-12. As shown in section C of this chapter – Alternative Funding Scenario, PVPC believes that it would take more than 80% plus Fair share money to reasonably maintain our existing federal aid eligible roadway system near its current condition, this estimate does not take into consideration money needed for bridges. Although Table 15-12 does not commit 100% of the funding to Maintenance, many of the improvements would include maintenance as a significant amount of the work completed.

Table 15-12 - Summary of Estimated Highway Needs over the Life of the RTP

80% plus Fair Share	2024 - 2028	2029 - 2033	2034 - 2038	2039 - 2043	2044 - 2048	2049- 2050	Totals
Congestion	\$22,479,754	\$25,608,101	\$29,823,045	\$33,110,690	\$36,543,378	\$15,703,072	\$163,268,039
Maintenance	\$195,909,325	\$223,172,629	\$259,905,541	\$288,557,120	\$318,472,727	\$136,851,067	\$1,422,868,408
*CMAQ	\$10,769,512	\$12,268,228	\$14,287,506	\$15,862,539	\$17,507,057	\$7,522,966	\$78,217,807
Safety	\$42,083,378	\$47,939,821	\$55,830,436	\$61,985,096	\$68,411,282	\$29,397,044	\$305,647,057
Bike	\$16,401,486	\$18,683,964	\$21,759,235	\$24,157,939	\$26,662,467	\$11,457,142	\$119,122,233
Transit	\$4,462,222	\$5,083,198	\$5,919,862	\$6,572,459	\$7,253,846	\$3,117,054	\$32,408,641
Bridge	\$161,008,947	\$183,415,414	\$213,604,521	\$237,151,948	\$261,738,222	\$112,471,656	\$1,169,390,707
Total Investment	\$453,114,623	\$516,171,354	\$601,130,146	\$667,397,790	\$736,588,978	\$316,520,000	\$3,290,922,892

- *CMAQ funding does not include funds which were allocated to Bike, Congestion, Safety, or Transit projects under the CMAQ funding category.
- The total investment required over the life of the RTP based on financial information provided by MassDOT.

For the purposes of operations and maintenance, the financial plan shall estimate the costs that are reasonably expected to be needed to maintain the federal aid highways and public transportation system (23 CFR 450.324(7)(h)). In an attempt to comply with this requirement, the total estimated needs from Table 15-12 were added to the estimated regional discretionary funding from Table 15-1 and compared to the total estimated highway revenue from Table 15-1. This information is presented in Figure 15-1.

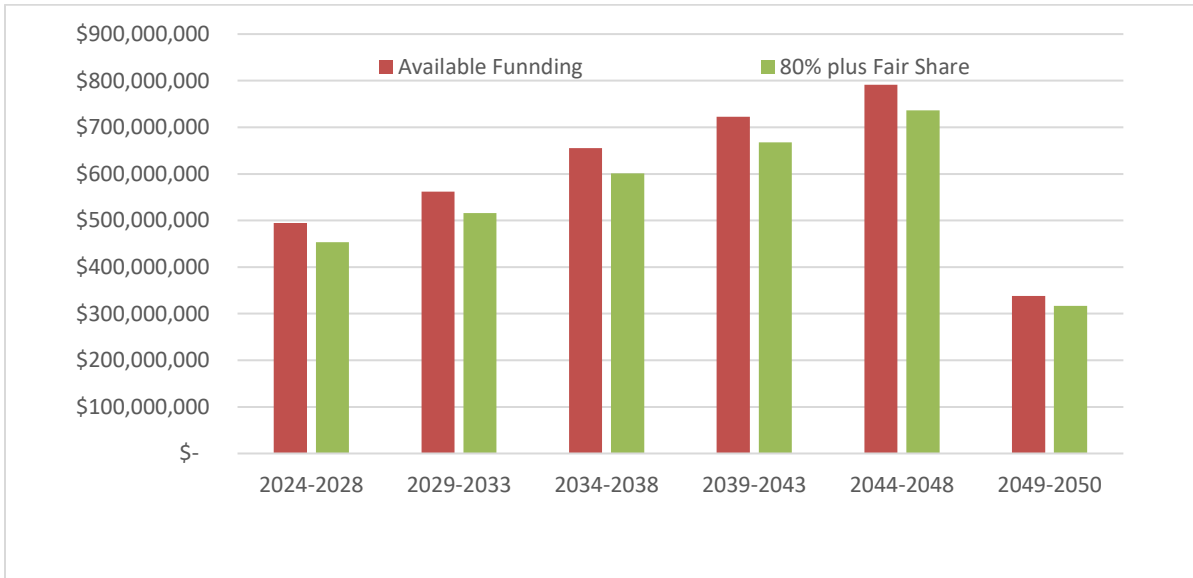
As can be seen in figure 15-1 the estimated highway revenue exceeds the estimated highway needs over the life of the RTP. However it is not feasible to spend over 80% of all funding on maintenance, State and Federal standards require funding to be allocated to different types of projects as show in Table 15-12. It should be noted that while Figure 15-1 indicates available funding to support needs based on historic spending, there is still a large need for additional funding to keep the transportation system in a state of good repair over the long term.

b) Transit Needs

Secure funding for transit operations and projects in the region is a key concern. In 2014 Massachusetts Legislation approved forward funding for the Regional Transit Authorities (RTA's). Forward funding allows the RTA's to pay for needs up front rather than being required to borrow money to pay for needs, which results in interest payments. In the short term, this along with increased operating assistance allowed PVTA to make both service and capital improvements system wide. Over the past couple of years, funding has not matched the cost increases that occur on a yearly basis at all RTA's. As a result, RTA's have been forced to reduce both

service and capital projects. A summary of the estimated transit needs over the life of the RTP is presented in Table 15-13.

Figure 15-1 - Comparison of Estimated Highway Needs and Revenue



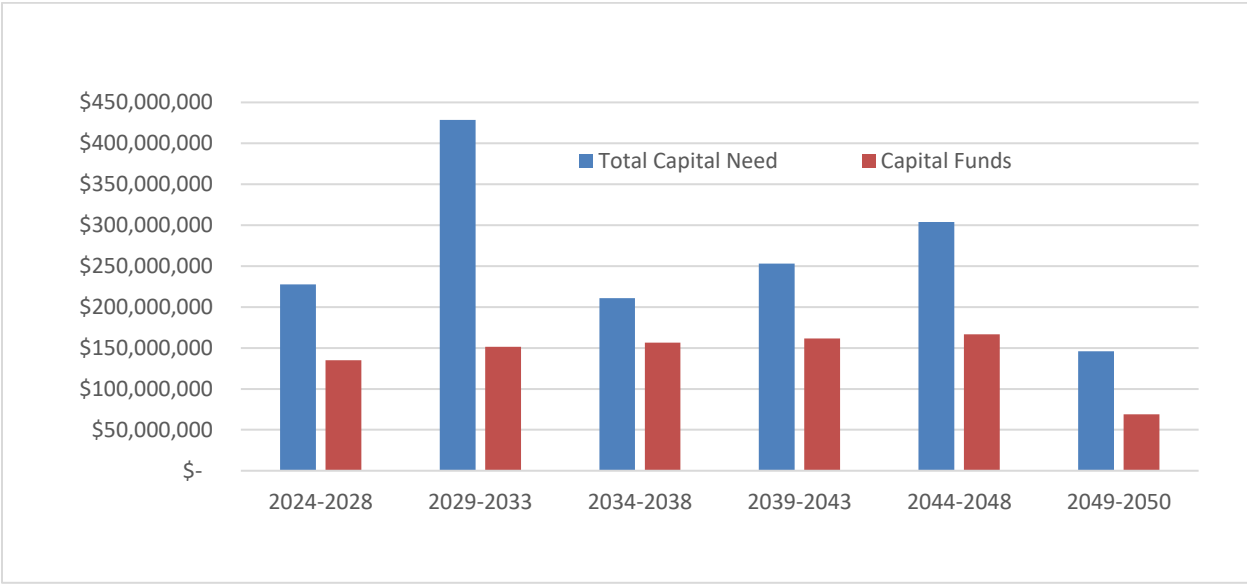
In addition, operating funding needs also include \$1,000,000 per year (escalated 4% annually) for FRTA paratransit in 14 outlying towns in the PVPC region that are not served by PVTA. FRTA anticipates that the cost of providing paratransit van service in the 14 PVMPO municipalities not served by PVTA will increase at a rate greater than 4% in the due to the growing need to replace volunteer drivers with professional drivers in many communities.

The funding outlook with respect to capital project needs is also a significant concern. Figure 15-2 shows the anticipated transit capital project needs versus estimated revenues (2024-2050) for the region. It shows that over the life of this plan, the gap between estimated capital needs (\$1,318,881,556) and anticipated revenue (\$839,932,876) would be \$479 million. Therefore, transit capital needs are 50% greater than the amount of funds that are expected to be available.

Table 15-13 - Estimated Transit Need 2020 – 2040

Estimated Transit Capital Need							
Paratransit/Main Street O&M Total	\$7,050,000						\$7,050,000
Cottage Street Bus O&M Facility	\$54,980,250						\$54,980,250
Holyoke Intermodal Transportation Center	\$250,000						\$250,000
Northampton Garage rehabilitation	\$5,230,000						\$5,230,000
Northampton Intermodal Center	\$500,000	\$80,750,250					\$81,250,250
UMTS Maintenance Facility	\$12,640,000	\$24,304,000					\$36,944,000
Admin Building/Main Street Operations	\$600,000						\$600,000
Full System Electrification - Cottage Street Facility		\$147,600,000					\$147,600,000
Full System Electrification - Umass Facility		\$18,600,000					\$18,600,000
Full System Electrification - Northampton Facility		\$22,800,000					\$22,800,000
PVTA Facility maintenance/Environmental	\$1,090,000	\$1,308,000	\$1,569,600	\$1,883,520	\$2,260,224	\$1,084,908	\$7,021,344
PVTA Fleet Replacement Program	\$82,505,663	\$99,006,796	\$118,808,155	\$142,569,786	\$171,083,743	\$82,120,197	\$531,468,479
Vehicle Maintenance	\$39,749,580	\$47,699,496	\$57,239,395	\$68,687,274	\$82,424,729	\$39,563,870	\$256,050,895
Bus Shelters and Bike Access Equipment	\$443,000	\$531,600	\$637,920	\$765,504	\$918,605	\$440,930	\$2,853,629
Bus stop sign replacement	\$110,000	\$132,000	\$158,400	\$190,080	\$228,096	\$109,486	\$708,576
ITS/AVL and communication equipment	\$18,083,542	\$21,700,250	\$26,040,300	\$31,248,361	\$37,498,033	\$17,999,056	\$116,486,944
MAP van program	\$4,500,000	\$5,400,000	\$6,480,000	\$7,776,000	\$9,331,200	\$4,478,976	\$28,987,200
Total Capital Need	\$227,732,035	\$469,832,392	\$210,933,770	\$253,120,524	\$303,744,629	\$145,797,422	\$1,318,881,566
Estimated Transit Operating Needs 2020-2040							
PVTA Fixed Route	\$225,107,380	\$260,724,958	\$302,091,080	\$350,158,172	\$406,183,480	\$175,471,263	\$1,544,265,070
PVTA Paratransit	\$52,283,505	\$60,556,054	\$70,163,761	\$81,327,838	\$94,340,292	\$40,755,006	\$358,671,451
PVTA Administration	\$12,094,509	\$14,008,161	\$16,230,669	\$18,813,204	\$21,823,317	\$9,427,673	\$82,969,860
FRTA Paratransit	\$4,415,643	\$5,114,307	\$5,925,734	\$6,868,604	\$7,967,581	\$3,441,995	\$30,291,869
Insurance	\$13,541,952	\$15,684,625	\$18,173,118	\$21,064,725	\$24,435,082	\$10,555,955	\$92,899,502
IT Support	\$2,104,244	\$2,437,188	\$2,823,867	\$3,273,186	\$3,796,895	\$1,640,259	\$14,435,380
Total Operating Need (4% annual Escalation)	\$309,547,233	\$358,525,293	\$415,408,229	\$481,505,730	\$558,546,646	\$241,292,151	\$2,364,825,283

Figure 15-2 - Pioneer Valley MPO Transit Capital Needs vs. Estimated Revenue



c) Rail Needs

Similar to highway and transit needs, an estimate was developed of the regional rail needs based on completed study recommendations advocating for expanded passenger rail service. This information is shown in Table 15-13. It should be noted that these estimates are presented for informational purposes only as these projects are not currently part of the financially constrained RTP. Enhanced passenger rail service does, however, remain a high regional priority that is recommended should an adequate funding source be identified.

Table 15-14 - Estimated Rail Need 2016 – 2050

Rail Capital Needs									
Project Name	Project Description	Community	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2050	Total
Western Mass to Boston Passenger Rail Service Study	East/West high speed rail Capital entire system - Boston to Springfield to Pittsfield	Regionwide	current study						TBD
Commuter Rail	Commuter Rail - Springfield to Greenfield - Capital	Regionwide	\$1,300,000						\$1,300,000
NECR Track Improvements to accommodate 286K	Freight rail track improvements	Regionwide	\$19,200,000						\$19,200,000
Patriot Corridor	Double Stack freight operations Study	Regionwide	further study						\$0
Ware River Secondary Projects	1.2 mile connection between MassDOT Ware River line and CSX	Regionwide	\$9,700,000						\$9,700,000
Track Expansion	Track Expansion Palmer Ind Park	Palmer		\$570,000					\$570,000
Westfield Industrial Park Track Expansion	Track Expansion Westfield Ind Park	Westfield		\$3,025,070					\$3,025,070
Boston to Springfield to Montreal Passenger Rail Service	East/West and North/South Passenger Rail Service from Boston to Montreal	Regionwide		Further Study					\$0
Northern Tier Passenger Rail (Boston/Greenfield/N. Adams)	East/West Passenger Rail Service from Boston to North Adams	Franklin / Hampshire / Berkshire County			\$1,000,000,000 to \$2,000,000,000				\$1,000,000,000 to \$2,000,000,000

Rail Operating Needs									
Project Name	Project Description	Community	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2050	Total
Passenger Rail Operating Cost	Connecticut State Line to Greenfield - Operating Per \$2,980,000 per year	Regionwide	\$16,140,641	\$19,637,558	\$23,892,092	\$29,068,383	\$35,366,133	\$14,712,311	\$138,817,118
Springfield to Greenfield Pilot	Passenger Rail Service	Regionwide	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000	\$2,000,000	\$27,000,000
High Speed Rail Operating for entire corridor	East/West high speed rail Operating entire system -Boston to Springfield to Pittsfield	Regionwide	TBD	TBD	TBD	TBD	TBD	TBD	TBD
			\$21,140,641	\$24,637,558	\$28,892,092	\$34,068,383	\$40,366,133		\$165,817,118

- Knowledge Corridor operating cost are based on Option 1 of the March 23, 2015 HDR Rail Service Analysis
- Operating cost for are inflated by 4% annually

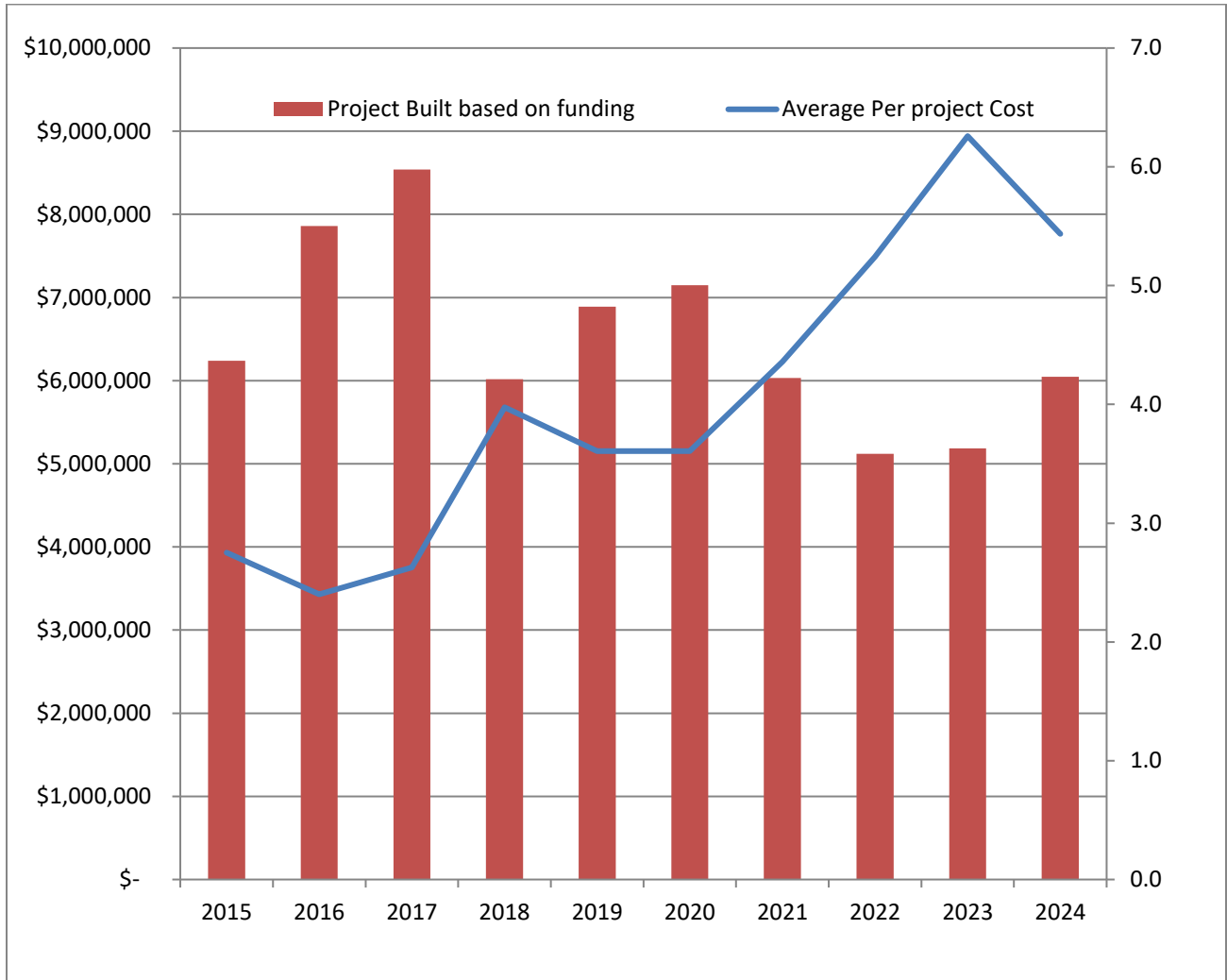
D. ALTERNATIVE FUNDING SCENARIOS

It is estimated it will take 10 years to fund all of the current projects included in the TIP backlog for the Pioneer Valley. This is a growing concern as regional targets have not increased at the same rate as project costs. Inflation plays a big role in the number of projects and cost of projects funded per year as costs rise significantly the further out in the RTP they are programmed. On average over the past 5 years the PVMPO has been able to fund 5 transportation projects per year using regional discretionary funds. As can be seen in Figure 15-3 the average project cost has been increasing in our region resulting in few projects being built each year.

Based on this information, the region does not have enough money to fund our transportation program in a financially viable time frame. In order to identify the amount of money necessary to fund the transportation program in a financially viable time frame PVPC staff utilized scenario-based planning to develop a series of scenarios to identify the funding necessary to maintain our regional overall pavement condition index at or near its average level. This information is summarized in Figure 15-4 and Table 15-15.

The [Fair Share tax](#) is an additional tax applied to those with incomes over a \$1 million in earnings. Current estimates for fiscal year 2023 is \$2 billion in additional tax revenues. According to the [Governor's office](#), 25% (\$500 million) of the funding will be used to support the existing Transportation system. For these funding scenarios it is assumed that \$100 million is being allocated to the MPO's based on the MARPA formula. Based on this assumption the PVMPO would receive 10.8099% of the \$100million or \$10,808,900 of the funds Fair Share Tax. The Fair Share funds are being inflated (4% per year) as is the Regional Target funds.

Figure 15-3 - Project Built vs. Project Cost 2015 - 2024



1. Summary of Identified Scenarios

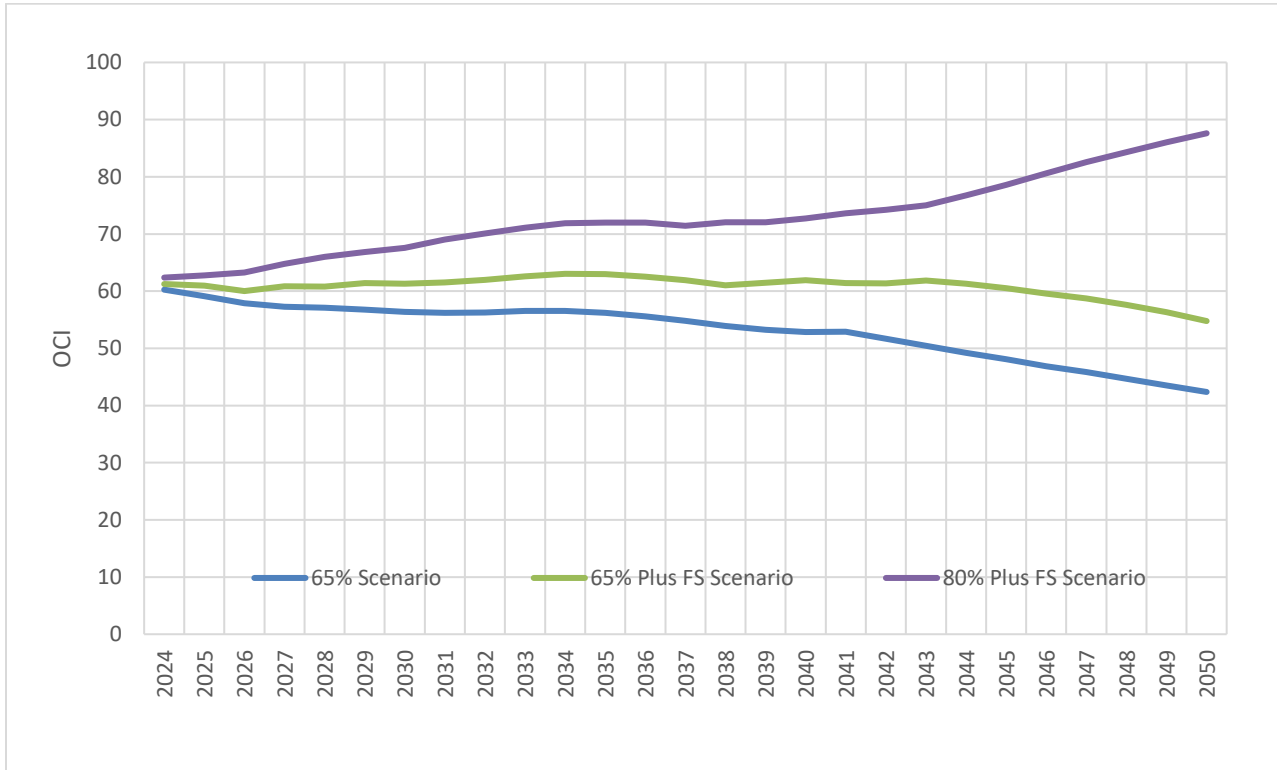
a) 65% Scenario – Uses 65% Regional Discretionary Funds, Non Interstate, and Other Statewide Funds to fund pavement maintenance

This Scenario assumes an investment of 65% of all Regional Discretionary funding and 65% of all Remaining Statewide Program funding over the life of the plan be allocated towards pavement maintenance.

b) 65% Plus Fair Share Tax Scenario – Uses 65% Regional Discretionary Funds, Non Interstate, and Other Statewide Funds to fund pavement maintenance plus the additional fair share funds as outlined previously.

This Scenario assumes an investment of 65% of all Regional Discretionary funding and 65% of all Remaining Statewide Program funding over the life of the plan be allocated towards pavement maintenance in addition to the fair shar allocation outlined above.

Figure 15-4 - Projected OCI Based on Scenarios



c) 80% Plus Fair Share Tax Scenario – Uses 80% Regional Discretionary Funds, Non Interstate, and Other Statewide Funds to fund pavement maintenance plus the additional fair share funds as outlined previously.

This Scenario assumes an investment of 80% of all Regional Discretionary funding and 80% of all Remaining Statewide Program funding over the life of the plan be allocated towards pavement maintenance in addition to the fair share allocation outlined above.

As can be seen in figure 15-4 both the 65% scenario and the 65 + FS% slows the deterioration for the first 10 years of the RTP. The 65% scenario begins to drop off in 2034 when the next round of GANS payments begin, the rate of deterioration increases exponentially after 2041. The 65% + FS scenario is able to maintain the current OCI until beginning to drop off in 2044. Both scenarios indicate the need for additional funding to show a long-term improvement to the overall roadway condition for the region.

Under the 80% + FS Scenario, a significant funding commitment is being made to attempt to bring the roadway system up to a state of good repair. A total of \$453 million is being spent in the first five years of the plan under this scenario, this results in a slight increase in the average OCI for the region. A slight increase is seen from 2028-2032, due to the GANS payments being complete which will allow for additional funding for roadways. The next round GANS payments begin in 2032 and increase from \$10,000,000 to \$30,000,000 by 2034. As can be seen in Figure 15-4 the region will experience a slight decrease from 2034-2037 before the OCI begins to improve for the remainder of the RTP scenario.

A summary of the investment totals by scenario is shown in Table 15-15.

Table 15-15 - Alternative Funding Scenarios for the State of Good Repair

RTP Bin	65% Scenario	60% Plus FS Scenario	80% Plus FS Scenario
Year	65% All Funding	60% + FS Funds	80% + FS Funds
2024-2028	\$321,525,259	\$378,916,486	\$453,114,623
2029 - 2033	\$365,331,844	\$431,864,005	\$516,171,354
2034 - 2038	\$425,750,923	\$502,879,933	\$601,130,146
2039 - 2043	\$469,612,104	\$559,025,766	\$667,397,790
2044-2048	\$514,258,906	\$617,913,846	\$736,588,978
2049-2050	\$219,841,322	\$265,787,388	\$316,520,000
Totals	\$2,316,320,357	\$2,756,387,425	\$3,290,922,892

2. Local Revenue Options ¹⁶

The ability to establish a local revenue source to fund transportation improvements in the Pioneer Valley region would first require action by the Massachusetts Legislature. It would also require a successful ballot initiative by local voters. The information below on local revenue options is provided solely to illustrate options that other states have used to raise additional revenue to fund transportation improvement projects.

1. Local Motor Fuel Tax - The revenue base provided by these optional taxes is supplemental in nature because fuel taxes in addition to state and federal fuel taxes would likely cause drivers to purchase fuel outside the local area levying the tax.
2. Local Motor Vehicle Registration Fee - Local counties and municipalities are authorized by many states to levy an additional fee on motor vehicle registration. These fees are typically collected by the state and returned to the locality. Most

¹⁶http://www.transportation-finance.org/funding_financing/funding/local_funding/

local registration fees are used for general revenue or directed towards transportation purposes, often for pay-as-you-go routine maintenance or operations. Some specific transportation improvement programs are funded through local registration fees.

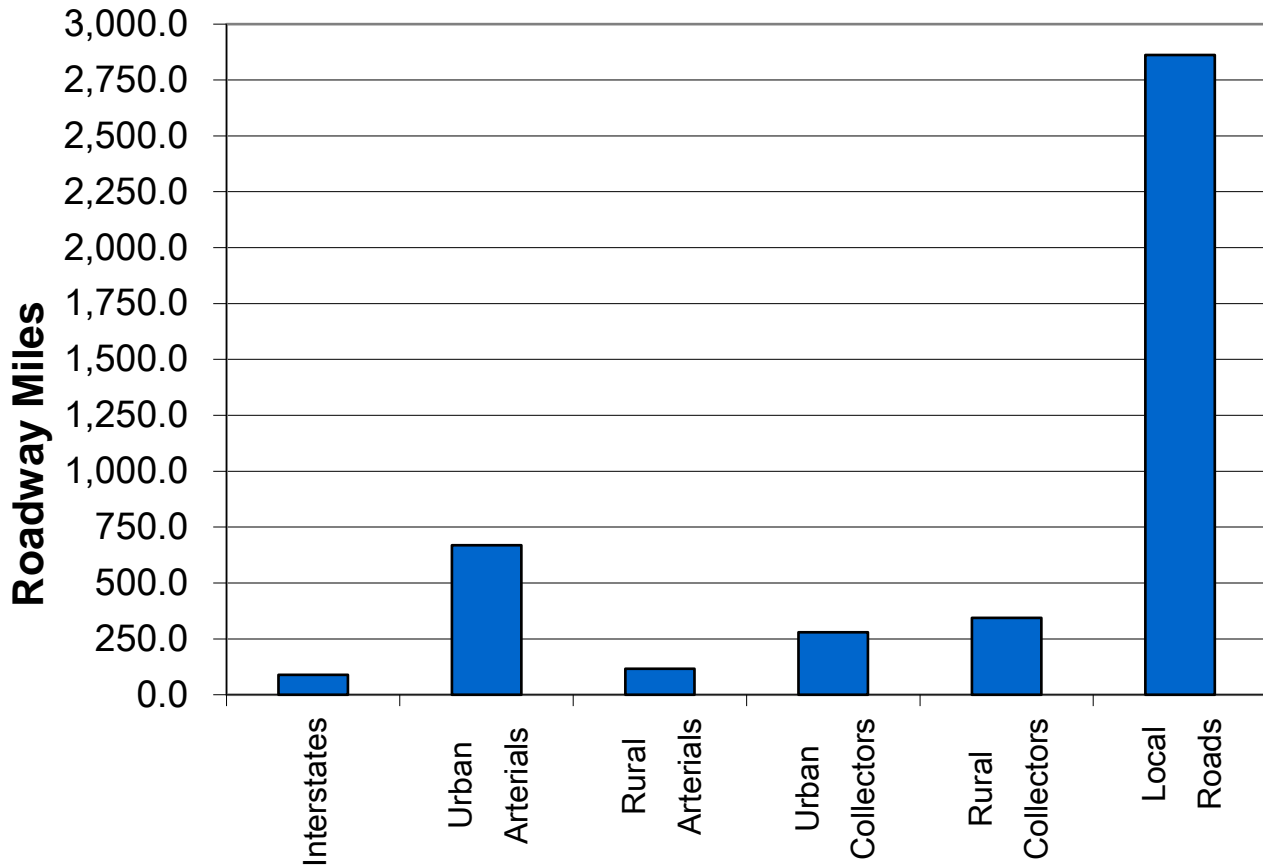
3. Local Option Sales Tax - Many states authorize localities to levy local option sales taxes for transportation purposes. The use of a local option sales tax requires a voter referendum. Spending authority varies from state to state, some granting localities the choice of earmarking funding or using it as general revenue. Other states require a specific purpose be attached to the tax, such as roadway improvement projects.
4. Local Income/Payroll/Employer Tax – Local income taxes are levied across a particular municipality. This can create differences in neighboring income tax rates that discourage residents from settling there. Payroll taxes (often referred to as commuter taxes), on the other hand, are based on the total of all salaries paid out by employers, effectively taxing a place of employment rather than a place of residence. One example of the application of these taxes would be to support transit service into a city.
5. Local Severance Taxes - A severance tax is a weight-based charge levied on operators of natural resource extraction operations such as coal, timber, or stone. It is used to fund road improvements in several rural regions of states where heavy truck operations from these activities cause a disproportionate amount of damage to remote roads.
6. Value Capture - Value capture refers to cases where the public sector is able to capture some of the increased value, usually property value that results from public investment. Some transportation investments, such as a new freeway or interchange for example, increase the value of adjacent properties by improving access.
7. Tax Increment Financing - Tax Increment Financing (TIF) allows cities or counties to create special districts to generate extra tax revenue and to use that new income to make public improvements. The legislative process for implementing and utilizing TIF financing is a complicated process involving the creation of the special district and the public agency to act as the administrator of the funds.

3. Local Pavement Maintenance Needs

Currently, roadways classified as “local” roads are not eligible for federal funds. In the Pioneer Valley Region, the vast majority of roadways (66%) are classified as local roads, meaning that over two thirds of all roads in the region are being

maintained using Chapter 90 funds or other local sources of revenue. See Figure 15-5.

Figure 15-5 - Miles of Roadway by Functional Classification

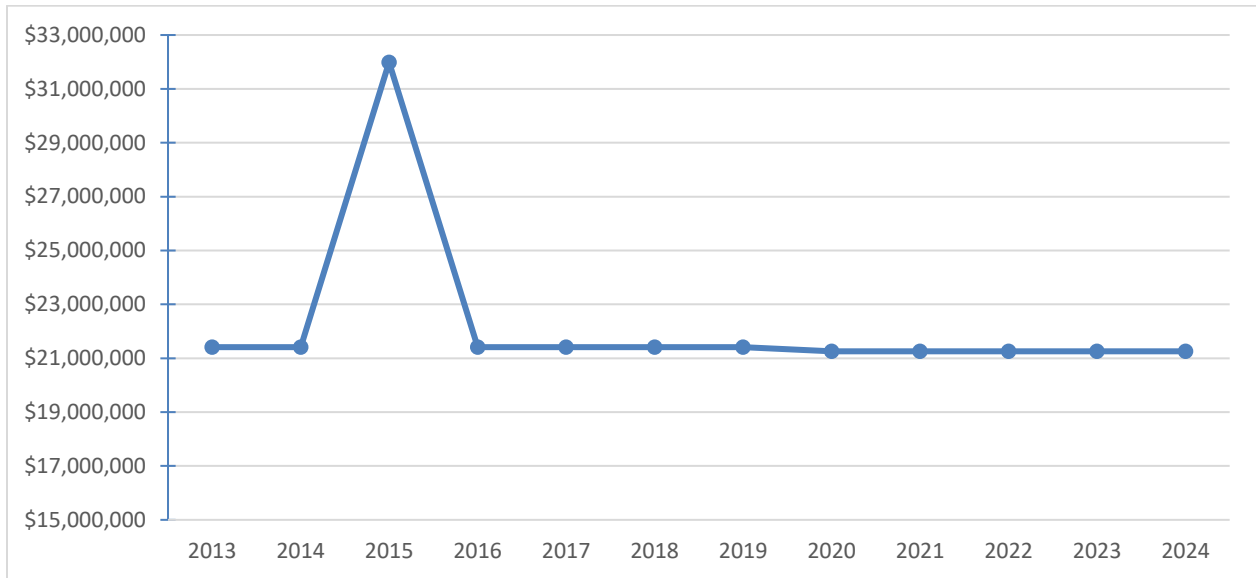


During the past several years a number of political, social, and economic trends have influenced the form and substance of local highway maintenance practices. Significant among them is the increasing pressure of fiscal austerity on local resources which place constraints on local tax revenues and make it difficult for the local highway superintendent or engineer to adequately meet the maintenance needs of local roads in the community.

The cost increase to maintain local infrastructure, the loss of local revenue, and the need for more Chapter 90 funding are common concerns of local communities in the region. The state’s Chapter 90 allocation had been level funded since the middle of the 1990s. As can be seen in Figure 15-6, in recent years Chapter 90 funding has been mostly level funding. In 2015 the Governor of Massachusetts approved an additional \$100,000,000 (\$10.5 million to the Pioneer Valley) in Chapter 90 funding. Over the past couple years, the Governor has not matched the \$300,000,000

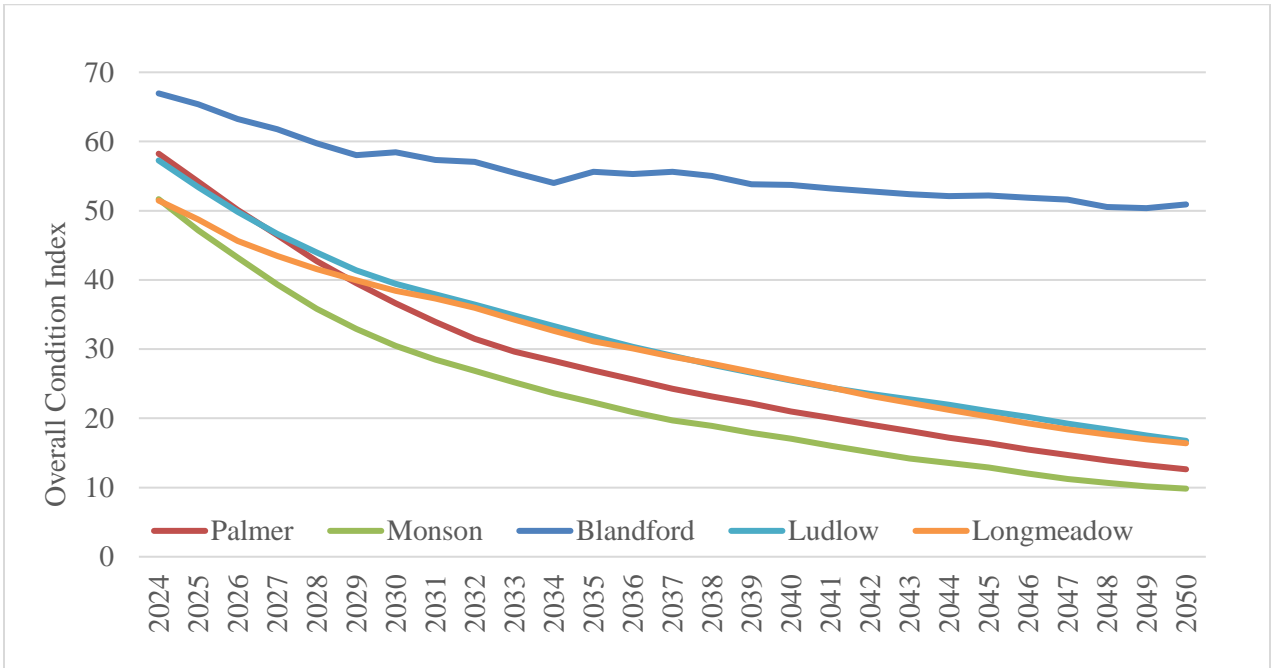
committed in 2015, instead level funding Chapter 90 at \$200,000,000. The (Massachusetts Municipal Association) MMA as well as local officials have been lobbying to tie Chapter 90 funding to inflation to ensure rising maintenance costs do not negate increases in allotments.

Figure 15-6 - Pioneer Valley Municipal Chapter 90 Funding 2013-2024



PVPC reviewed the long term impact of existing Chapter 90 Funding levels on local roadways in five communities. This information, presented in Figure 15-7, shows a clear downward trend over time indicating the current level of funding is not sufficient to maintain the condition of local roadways into the future. As the cost of construction materials continues to increase, the condition of roads will continue to deteriorate. This decline in the average OCI level is the result of the improvement rate being offset by the roadway deterioration rate. Also, the number of needed repairs (backlog) increases as the average OCI declines.

Figure 15-7 - OCI Projections Based on Current Chapter 90 Program

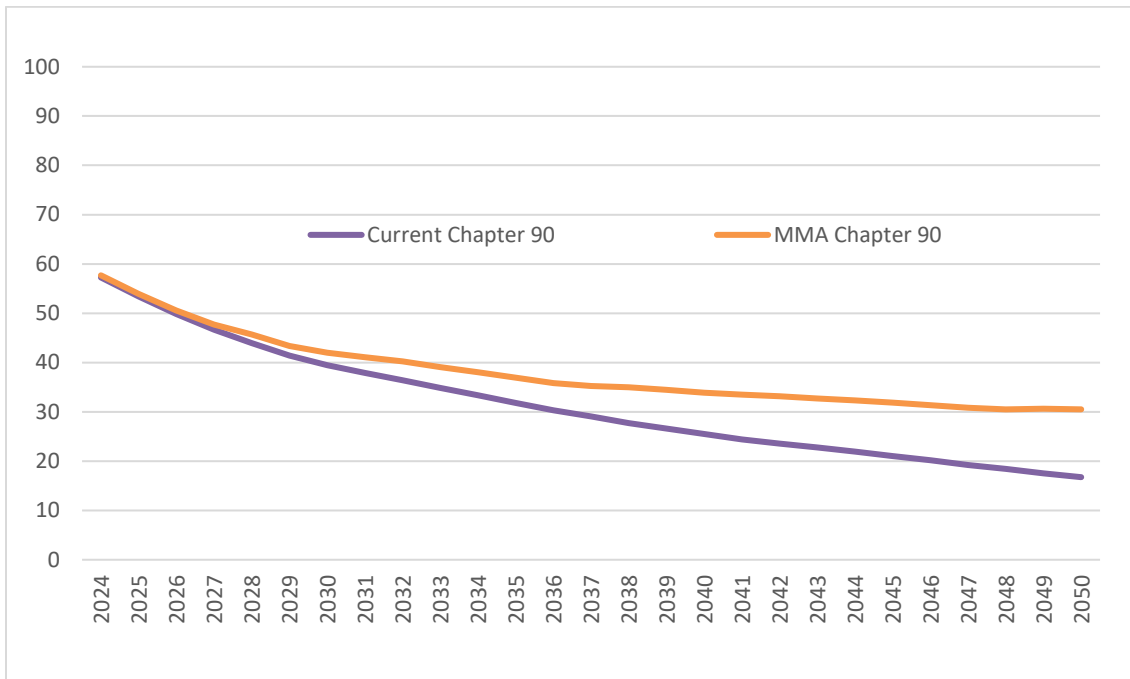


As can be seen in Figure 15-7, overall Condition Index (OCI) is projected to continue to decrease every year over the next 27 years. According to the Massachusetts Municipal Association (MMA), a [Chapter 90 funding level of \\$330,000,000](#) with a yearly inflation adjustment is needed statewide in order to bring local roads up to a state of good repair.

PVPC staff developed a scenario based on the MMA recommendation of \$330 million in Chapter 90 to see if the funding would be sufficient to maintain the current OCI for a municipality. Under the scenario, it is assumed that 100% of MMA recommended local Chapter 90 funding is being applied to pavement maintenance. PVPC staff chose one local community in the Pioneer Valley region and ran the scenario.

Based on this scenario shown in Figure 15-8, the increased funding as well as the 4% per year increase would slow the decline of the sample communities average OCI score. As can be seen in the figure, the OCI drops at the same rate as the current Chapter 90 scenario for the first three years before beginning to show signs of slowing. By 2050 the MMA average OCI is a 30.53 which is almost double (16.75) the average OCI for level funded Chapter 90. It is important to note that the MMA reports states that a year one (2024) investment of \$715 million is needed to keep system up to a state of good repair.

Figure 15-8 - OCI Projections Based on MMA Recommended Chapter 90 Program



If level funded, the Chapter 90 program will provide about \$574 million in funding to the PV Region of the life of the plan. Based on our scenario the Chapter 90 program would provide \$1.248 billion over the next 27 years.

4. Regional Transit Needs

One of the biggest hurdles for the Regional Transit Authorities (RTA) has been securing funding to maintain current service levels. In 2014 PVTA completed a Comprehensive Service Analysis (SCA). The SCA included recommendations to both enhance existing service as well as expand service. Since the implementation of the original recommendations, PVTA has been forced to cut service twice. The purpose of this scenario is to identify the funding necessary to reinstate service PVTA was forced to cut as well as the funding PVTA would require to expand transit service to better meet the needs of the region.

PVTA receives 29% of the SCA released per year. In FFY 2023, PVTA received \$27.6 million which accounted for 49% of PVTA’s operating budget.

Under this scenario, it was assumed that PVTA would receive a total of \$27.6 million in SCA funds in FFY 2024 and be inflated 4% per year for the life of the plan. The operating funding breakdown shown in Figure 15-9 was then used to determine operating funding available over the life of the plan in 5-year bins. Figure 15-10 compares the scenario to existing conditions (level funding). Based on this scenario, PVTA would be close to meeting the anticipated operating needs over the first 5

years before falling behind. This indicates that more funding is needed for PVTA to provide additional services for the region.

Figure 15-9 - PVTA Operating Funds Breakdown

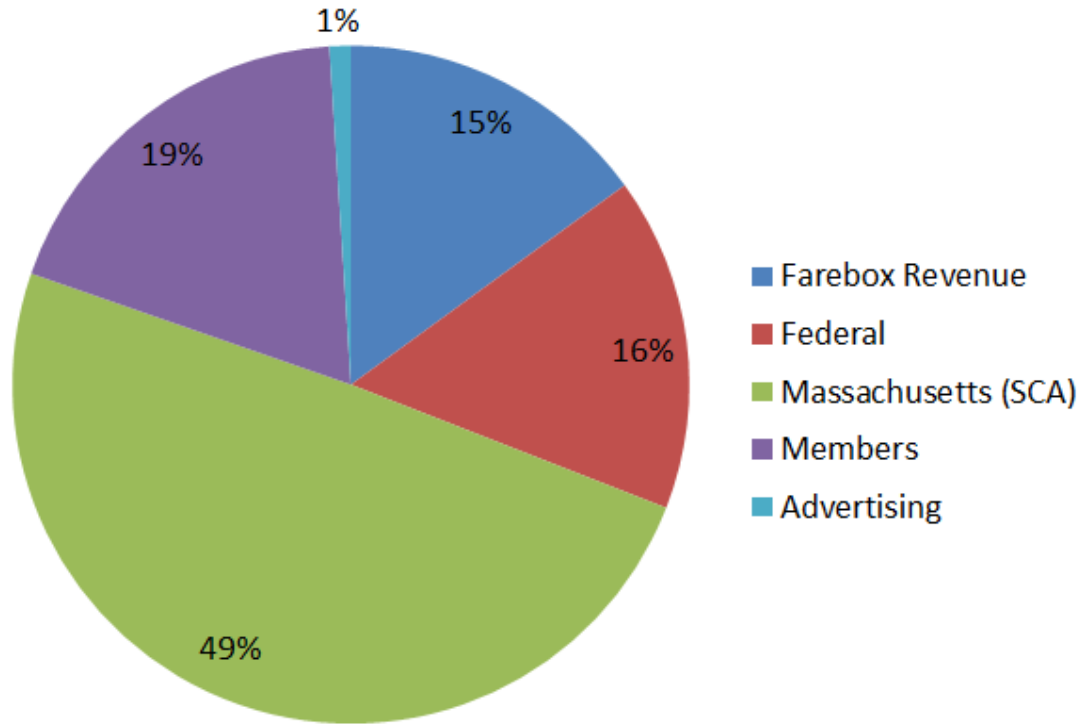
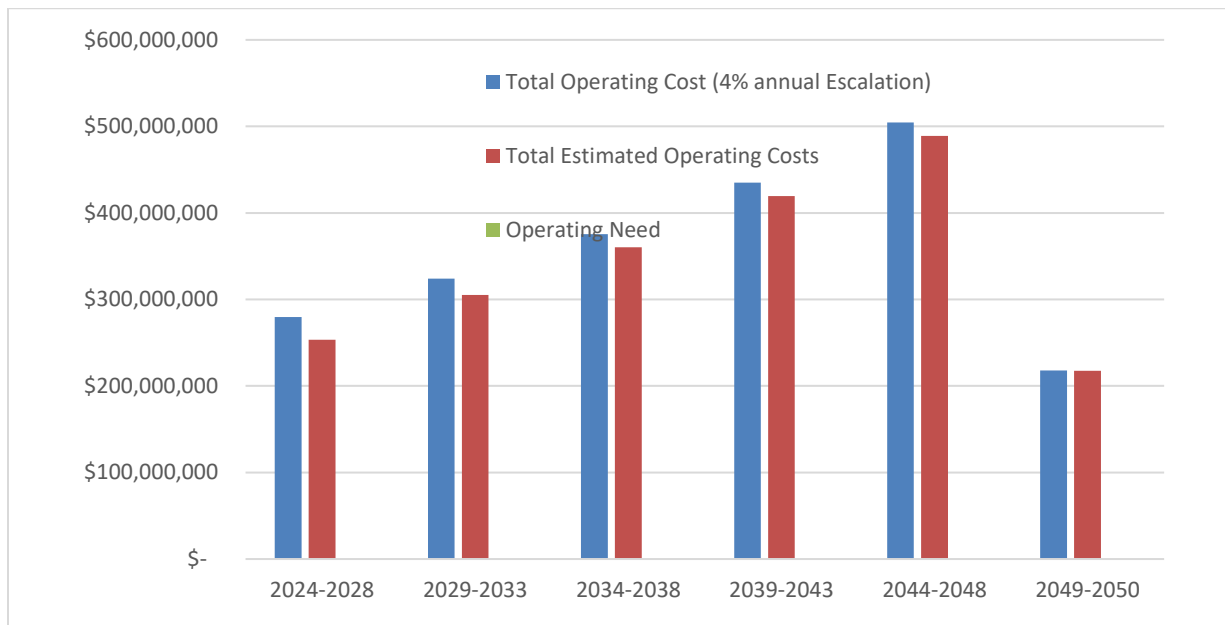


Figure 15-10 - PVTA Operating Funds Scenario



16.CONFORMITY

A. AIR QUALITY CONFORMITY INFORMATION

This section documents the latest air quality conformity determination for the 1997 ozone National Ambient Air Quality Standards (NAAQS) in the Pioneer Valley 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:

B. 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 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.

C. 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 (NO_x), 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 has 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.

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 and the replacement with the 2008 Ozone NAAQS, which (with actually a stricter level of allowable ozone concentration than the 1997 standards) classified Massachusetts as "Attainment/unclassifiable" (except for Dukes County).

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).

D. 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, a conformity determination was made for the 1997 ozone NAAQS on the 2020-2040 Regional Transportation Plans. This conformity determination was finalized in July 2019 following each MPO’s previous endorsement of their regional transportation plan and approved by the Massachusetts Divisions of FHWA and FTA on October 15, 2019. This conformity determination continues to be valid for the PVMPO FFY 2024-2028 Transportation Improvement Program, and Massachusetts’ FFY 2024-2028 STIP, as each is developed from the conforming 2024-2044 Regional Transportation Plans.

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 Pioneer Valley Region FFY 2020-2024 Transportation Improvement Program and 2020 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)

1. Latest Planning Assumptions

The use of latest planning assumptions in 40 CFR 93.110 of the conformity rule generally applies 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).

2. 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 Massachusetts MPOs on March 6, 2019, to discuss the latest conformity-related court rulings and resulting federal guidance. Regular and recurring interagency consultations have been held since on an (at least) annual schedule, with the most recent conformity consultation held on April 27, 2022. 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".

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 Pioneer Valley MPO's Public Participation Plan was formally adopted in 2016 and updated in September of 2022. The Public Participation Plan ensures that the public will have access to the RTP and all supporting documentation, provides for public notification of the availability of the RTP and the public's right to review the document and comment thereon, and provides a 21-day public review and comment period prior to the adoption of the RTP and related certification documents.

The public comment period for this conformity determination commenced on June 27, 2023. During the 21-day public comment period, any comments received were incorporated into this Plan. This allowed ample opportunity for public comment and

MPO review of the draft document. The public comment period will close on July 21, 2023, and subsequently, the Pioneer Valley MPO is expected to endorse this air quality conformity determination on July 25, 2023. These procedures comply with the associated federal requirements.

3. 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.

4. 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 2020 Regional Transportation Plan for the Pioneer Valley is fiscally constrained, as demonstrated in Chapter 16 of the RTP.

The requirement to perform a conformity determination for carbon monoxide (CO) for the city of Springfield/ has expired. On April 22, 2002, the EPA classified Springfield as being in attainment (in compliance) for CO emissions. Subsequently, an EPA-approved CO limited maintenance plan was set up through the Massachusetts SIP to ensure that emission levels did not increase. While the maintenance plan was in effect, past TIPs and RTPs included an air quality conformity determination against a "budget test" (using "hot spot" analyses as needed at the project level) for Springfield. As of April 22, 2022, however, the 20-year maintenance period for this CO area expired and transportation conformity is no longer required for this pollutant in this municipality. This ruling is documented in a letter from EPA dated April 26, 2022.

In summary and based upon the entire process described above, the Pioneer Valley 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 Pioneer Valley MPO's FFY 2020-2024 Transportation Improvement Program and the 2020 Regional Transportation Plan are consistent with the air quality goals of, and in conformity with, the Massachusetts State Implementation Plan.

E. EVALUATION AND REPORTING OF STATEWIDE GREENHOUSE GAS REDUCTIONS IN TRANSPORTATION

This section documents recent progress made by MassDOT and the MPOs in working to help achieve greenhouse gas (GHG) reduction goals as outlined in state regulations applicable to Massachusetts. This “progress report” estimates future carbon dioxide (CO₂) emissions from the transportation sector as part of meeting the GHG reduction goals established through the Commonwealth’s Global Warming Solutions Act (GWSA).

1. GWSA Transportation Status: Future Carbon Dioxide Emissions Reductions

The Global Warming Solutions Act of 2008 requires statewide reductions in greenhouse gas (CO₂) emissions of 25 percent below 1990 levels by the year 2020, and 80 percent below 1990 levels by 2050.

The Commonwealth’s thirteen metropolitan planning organizations (MPOs) are involved in helping to achieve greenhouse gas reductions mandated under the GWSA. The MPOs work closely with the Massachusetts Department of Transportation (MassDOT) and other involved agencies to develop common transportation goals, policies, and projects that would help to reduce GHG emission levels statewide and meet the specific requirements of the GWSA regulation – *Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation (310 CMR 60.05)*. The purpose of this regulation is to assist the Commonwealth in achieving their adopted GHG emission reduction goals by:

- Requiring each MPO to evaluate and report the aggregate GHG emissions and impacts of both its Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP).
- Requiring each MPO, in consultation with MassDOT, to develop and utilize procedures to prioritize and select projects in its RTP and TIP based on factors that include GHG emissions and impacts.

Meeting the requirements of this regulation is being achieved through the transportation goals and policies contained in the Federal Fiscal Year (FFY) 2024 RTPs, the major projects planned in the RTPs, and the mix of new transportation projects that are programmed and implemented through the TIPs.

The GHG evaluation and reporting processes enable the MPOs and MassDOT to identify the anticipated GHG impacts of the planned and programmed projects, and also to use GHG impacts as a criterion in prioritizing transportation projects. This approach is consistent with the greenhouse gas reduction policies of promoting healthy transportation modes through prioritizing and programming an appropriate balance of roadway, transit, bicycle and pedestrian investments; as well as supporting smart growth development patterns through the creation of a balanced

multi-modal transportation system. All of the MPOs and MassDOT are working toward reducing greenhouse gases with “sustainable” transportation plans, actions, and strategies that include (but are not limited to):

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

2. Regional GHG Evaluation and Reporting in RTPs

MassDOT coordinated with MPOs and regional planning agency (RPA) staff on the implementation of GHG evaluation and reporting in development of each MPO’s 2016 and 2020 RTPs. This collaboration has continued in developing the MPOs’ FFY 2024 RTPs and FFYs 2024-28 TIPs. Working together, MassDOT and the MPOs have attained the following milestones:

- Modeling and long-range statewide projections for GHG emissions resulting from the transportation sector, as a supplement to the FFY 2024 RTPs. Using the newly updated statewide travel demand model, GHG emissions have been estimated for 2019 (base) conditions, and for 2050 base (“no-build” including existing and committed projects) and build (action) conditions (see the chart in this section for the results of this modeling).
- All of the MPOs have addressed GHG emission reduction projections in their RTPs (including the statewide estimates in the chart that follows), along with a discussion of climate change and a statement of MPO support for reducing GHG emissions from transportation as a regional goal.

MassDOT’s statewide estimates of CO₂ emissions resulting from the collective list of all recommended projects in all Massachusetts RTPs combined are presented in the table below. Emissions estimates incorporate the latest planning assumptions including updated socio-economic projections consistent with the FFY 2024 RTPs:

Table 16-1 - Massachusetts Statewide Aggregate CO₂ Estimated Emissions Impacts from Transportation
 (All emissions in tons per summer day)

Year	CO ₂ Action Emissions	CO ₂ Base Emissions	Difference (Action – Base)
2019	75,113.6	75,113.6	n/a
2050	53,772.5	53,781.4	-8.9

This analysis includes only those larger, regionally significant projects that are included in the statewide travel demand model. Many other types of projects that cannot be accounted for in the model (such as bicycle and pedestrian facilities, shuttle services, intersection improvements, etc.), are covered in each MPO region’s RTP with either “qualitative” assessments of likely CO₂ change, or actual quantitative estimates listed for each project.

As shown above, collectively, all the projects in the RTPs in the 2050 Action scenario provide a statewide reduction of nearly 9 tons of CO₂ per day compared to the base (existing and committed projects) case.

These results demonstrate that the transportation sector is expected to continue making positive progress in contributing to the achievement of GHG reduction targets consistent with the requirements of the GWSA. MassDOT and the MPOs will continue to advocate for steps needed to accomplish the Commonwealth’s long-term goals for greenhouse gas reductions.

3. MPO Compliance Global Warming Solutions Act

All projects included in the RTP are evaluated for GHG impacts prior to being funded in the TIP. The PVMPO uses the [MassDOT Reporting and Evacuation Process](#) to perform qualitative and quantitative analysis on all projects included in the TIP. Quantifiable analysis cannot be completed until the project design has advanced beyond the 25% design phase. The 25% design phase is the Functional Design Reports is complete and most design elements have been identified. For the FFY 2024-2028 TIP, 14 highway projects resulting and an estimated GHG reduction of 113 thousand kg/year. Similarly on the transit side staff quantified the results of vehicle replacement including full electric buses. This results in an estimated reduction of over 3 million kg/year of GHG in the Pioneer Valley Region. The replacement of electric buses with new electric buses was evaluated as no reduction in GHG.

4. Determination of Statewide GHG Emission Limits

The Massachusetts Clean Energy and Climate Plan for 2025 and 2030, as issued pursuant to Chapter 21N, provides comprehensive, clear and specific roadmap plans for how the Commonwealth will achieve the 2025 and 2030 greenhouse gas (GHG) emissions limits established herein. Establishing these statewide GHG emissions limits and sector-based sublimits (see Table 16-2 for transportation sublimits) and outlining the specific and practical policy measures to achieve those limits is a milestone in the Commonwealth’s ongoing efforts to create a reliable clean energy economy, to reduce energy costs for customers, increase energy independence, and contribute to stabilizing our climate.

The Commonwealth of Massachusetts issued the [“Determination of statewide Greenhouse Gas Emissions Limits and Sector-Specific Sublimits for 2025 and 2030”](#) on June 22, 2022.

Table 16-2 - Transportation Sublimits

Transportation Sublimit	2025	2030
Reduction from 1990 Level	18%	34%

* All limits shown are represented as percentage reductions as compared to 1990 levels.

* See [Clean Energy and Climate Plan for 2025 and 2030](#), Chapter 3 for more details on the limits and sublimits.

5. Findings of Fact

Based on the findings and recommendations in the Massachusetts Interim Clean Energy and Climate Plan for 2030; the regional and Massachusetts-specific quantitative analysis conducted as part of EEA’s 2050 Decarbonization Roadmap effort; and the analysis conducted in connection with the development of the 2025 and 2030 Clean Energy and Climate Plans, the following findings were issued:

- The 2025/2030 CECP identifies ambitious but viable plans to achieve emissions reductions of at least 33% below the 1990 level for 2025 and at least 50% below the 1990 level for 2030 that balances targeted emissions reductions among and between sectors based on assessments of technical opportunities and limitations in each sector, cost-effectiveness, and the scope and pace of transformation in each sector necessary to maximize the Commonwealth’s ability to achieve Net Zero in 2050.
- The analysis supporting the 2025/2030 CECP shows that aggressive electrification of transportation sector assumes that the residents of the Commonwealth will increase their purchases and use of electric vehicles and that sufficient supplies of electric vehicles would be available in the marketplace.
- The analysis also shows that the lowest cost and lowest risk approach to decarbonize buildings is to immediately and aggressively pursue the use of

electric heat pumps, capturing the interest of those who are interested in using heat pumps for cooling in the summers, providing financial incentives and opportunities to gain experience with using heat pumps, and help heating systems transition away from the use fossil fuels. Thus, the Commonwealth's dominant building decarbonization strategy is electrification. Future analyses will be needed to update the potential costs and risks associated with additional approaches, particularly as new technologies evolve, and their relative costs change over time.

- Deploying renewable and clean energy to provide emission-free electricity is at the core of Massachusetts' clean energy transition. Such deployment requires a substantial number of investments in offshore wind, solar PV, energy storage, and transmission. All of these investments will require the Commonwealth to work closely with neighboring states, the Independent System Operator of New England, and federal agencies to reform the way the electricity wholesale market is designed, and transmission system is planned and deployed.
- Natural and working lands are Massachusetts' most valuable assets and protecting them will be a key to achieving the 2050 net zero emissions. Thus, great efforts are needed to protect, manage, and restore our natural and working lands. In addition to their ability to sequester and store greenhouse gases, they provide natural habitats for diverse ecosystems of plants and animals, and valuable places for recreation.
- Requiring emissions reductions in excess of 33% below the 1990 level in 2025 or 50% below the 1990 level in 2030 risks imposing undue expense and unnecessary economic impact on Commonwealth households and businesses without materially increasing the Commonwealth's ability to achieve Net Zero. Additionally, the amount of time between today's date and December 31, 2025, places feasibility constraints on what measures could be implemented to achieve GHG emissions reductions for 2025.

6. The Determination of 2025 and 2030 Limits

The findings listed above were signed by Secretary Card of the Executive Office of Energy and Environmental Affairs. The determine states that the interim statewide greenhouse gas emissions limits and associated sector-based sublimits listed above for 2025 and 2030, are reasonable and appropriate statewide emissions limits necessary to adequately protect the health, economy, people and natural resources of the Commonwealth, maximize the Commonwealth's ability to achieve net zero emissions in 2050, and maintain Massachusetts critically important role as a national and international leader in the global effort to reduce the greenhouse gas emissions that cause climate change in a manner consistent with the goals of the GWSA.¹⁷

The determination along with the reporting process for transportation projects demonstrate that the transportation sector is expected to continue making positive

¹⁷ [SD3238 -- EEA 2025-2030 Letter of Determination.pdf](#)

progress in contributing to the achievement of GHG reduction targets consistent with the requirements of the GWSA. MassDOT and the MPOs will continue to advocate for steps needed to accomplish the Commonwealth's long-term goals for greenhouse gas reductions.

F. COMPLIANCE WITH FEDERAL PLANNING EMPHASIS AREA

As documented in Chapter 2 of the RTP, FHWA and FTA have established Federal Planning Emphasis Areas to assist in the implementation of the BIL and guide regional transportation planning efforts. Specifically, the Tackling the Climate Crisis Emphasis Area outlines national greenhouse gas reduction goals as follows:

- **Tackling the Climate Crisis** – Transition to a Clean Energy, Resilient Future. The RTP should advance strategies that help achieve the national greenhouse gas reduction goals of 50-52 percent below 2005 levels by 2030, and net-zero emissions by 2050, and increase resilience to extreme weather events and other disasters resulting from the increasing effects of climate change.

The Pioneer Valley MPO certifies that the Goals, Strategies and Projects included as part of the 2024 Regional Transportation Plan comply with the national greenhouse gas reduction goals.



CHAPTER 17

17. ENVIRONMENTAL CONSULTATION

Regional Transportation Plans must provide information on the efforts to consult with federal, state and local agencies responsible for environmental, land use, and preservation in the development of the RTP. In addition, the RTP must include a discussion of the types of potential environmental mitigation activities and potential areas to carry out these activities. This chapter demonstrates how these requirements have been integrated into the RTP for the Pioneer Valley Metropolitan Planning Organization.

A. ENVIRONMENTAL CONSULTATION

The Pioneer Valley Metropolitan Planning Organization must consult “as appropriate” with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation to develop the long range transportation plan. PVPC scheduled an environmental consultation meeting on Wednesday May 3, 2023. Invitations were sent to a number of federal, state, and local agencies to review the draft transportation improvement projects included as part of the RTP. PVPC staff were available virtually for questions and comments from 1:00 PM to 3:00 PM. Transportation Improvement projects were mapped over several environmental maps including:

- Environmental Justice Minority Census Block Groups
- Environmental Justice Low Income Census Block Groups
- MassDOT REJ+ Layers
- Percent of Total Population with Disability
- Percent of 65 and Older Population with Disability
- UMass CAPS IEI Data
- BioMap 3 Layers

- Habitat – Road linkage importance for regional habitat connectivity.
- Habitat – Link importance for regional habitat connectivity.
- MassDEP Wetlands
- 500 Year Flood
- 100 Year Flood Zones
- Valley Vision Priority Development Areas
- Valley Vision Priority Protection Areas
- Massachusetts Historic Commission Historic Inventory Areas

An online interactive version of this map is located through the following link: [PVPC Regional Transportation Projects \(arcgis.com\)](#).

A complete list of agencies invited to participate in the Environmental Consultation is presented in Table 17-1. Each of these agencies will also be sent a draft copy of the RTP. Comments received as part of Environmental Consultation have been summarized in Table 17-2.

Table 17-1 – RTP Environmental Consultation Invite List

American Rivers	MassDOT
Appalachian Mountain Club	Mass Division of Fisheries and Wildlife
Arise for Social Justice	MassDEP
Army Corp of Engineers - NE District	One Holyoke
Baystate Health Partners for a Healthier Community	Pioneer Valley Asthma Coalition
Chicopee 4Rivers Watershed	Pioneer Valley Conservation Commissions
Connecticut River Conservancy	Pioneer Valley Planning Boards
Co-op Power	Public Health Institute of Western Mass
EPA	PVPC Commissioners
Federal Highway Administration	PVPC EJ List
Federal Lands Access Program	PVPC JTC Mailing List
Federal Transit Administration - Region 1	PVPC MPO Mailing List
Friends of Conte Refuge - MA Division	Springfield Water and Sewer Commission
Health Resources in Action	Stavros
HomeBuilders and Remodelers West. MA	Stockbridge-Munsee Community
Mass Audubon	The Hilltown Land Trust
Mass DCR - Greenways and Trails	The Kestrel Land Trust
Mass Division of Ecological Restoration	The Nature Conservancy
Mass Historic Commission	Trustees of Reservations
Massachusetts Association of Conservation Commissions	UMass Amherst
Mass Department of Agriculture	US Department of Agriculture
Mass Department of Public Health	Westfield River Watershed Association
	Westfield River Wild and Scenic

In addition to the above list, a meeting notice was posted on the PVPC website and in the Republican (the local newspaper) in both English and Spanish.

Table 17-2 – RTP Environmental Consultation Comments

Comment	From	MPO Response
Question on what projects included in the RTP are located in Williamsburg.	Chris Florey, Town of Williamsburg	Staff demonstrated how to use the interactive map and zoom in to view projects.
Question on what projects included in the RTP are located in Holyoke.	Gloria Cabal, City of Holyoke	Staff demonstrated how to use the interactive map and zoom in to view projects.
Question on how green amenities such as street trees and landscaping are addressed in the RTP.	Gloria Cabal, City of Holyoke	Staff gave a brief overview of the regional project scoring process and how strategies for green infrastructure are addressed in the RTP.
Question on what Environmental Justice mapping features are included as part of the interactive map.	Connor Knightly, Town of West Springfield	Staff demonstrated the map features and included Environmental Justice layers.
It was noted that some map layers have the same color scheme making it impossible to distinguish between the two layers	PVPC	This will be corrected for the final RTP.
There was a question on what “zvhh” stood for on the MassDOT REJ+ layer.	PVPC	It was determined that “zvhh” stands for “zero vehicle household” this will be clarified for the final RTP.

CHAPTER 18



18. ENDORSEMENT

The 2024 Regional Transportation Plan was endorsed at the July 25, 2023 meeting of the Pioneer Valley Metropolitan Planning Organization.

Figure 18-1 - 2024 Regional Transportation Plan Endorsement

Endorsement of the 2024 Update to the Pioneer Valley Regional Transportation Plan

The Pioneer Valley Metropolitan Planning Organization (PVMPO) hereby endorses the 2024 Update to the Pioneer Valley Regional Transportation Plan.

July 25, 2023



Gina Fiandaca, Secretary and Chief Executive Officer
Massachusetts Department of Transportation
Chair, Central Massachusetts MPO

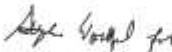
Figure 18-2 – Certification of the Pioneer Valley MPO Transportation Planning Process

Certification of the Pioneer Valley MPO Transportation Planning Process

The Pioneer Valley 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 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. 114-357) and 49 CFR Part 26 regarding the involvement of disadvantaged business enterprises in U.S. DOT-funded projects.
6. 23 CFR part 230, regarding implementation of an equal employment opportunity program on Federal and Federal-aid highway construction contracts.
7. The provisions of the US DOT and of the Americans with Disabilities Act of 1990 (42 USC 12101 et seq.) and 49 CFR Parts 27, 37, and 38.
8. The Older Americans Act, as amended (42 USC 6101), prohibiting discrimination on the basis of age in programs or activities receiving federal financial assistance.
9. Section 324 of Title 23 USC regarding the prohibition of discrimination based on gender.
10. Section 504 of the Rehabilitation Act of 1973 (29 USC 794) and 49 CFR Part 27 regarding discrimination against individuals with disabilities.
11. Anti-lobbying restrictions found in 49 CFR 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.

April 25, 2023



Gina Fiandaca, Secretary and Chief Executive Officer
Massachusetts Department of Transportation
Chair, Pioneer Valley MPO

Figure 18-3 - Certification Statement for the Global Warming Solutions Act Requirements for Transportation

310 CMR 60.05: Global Warming Solutions Act Requirements for Transportation

This will certify that the Transportation Improvement Program and Air Quality Conformity Determination for the 2024 Long Range Transportation Plan is in compliance with all applicable requirements in the State Regulation 310 CMR 60.05: Global Warming Solutions Act Requirements for Transportation. The regulation requires the PVMPO to:

1. 310 CMR 60.05(5)(a)1.: Evaluate and report the aggregate transportation GHG emissions 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 impact analysis of RTPs and TIPs;
8. 310 CMR 60.05(8)(a)2.d.: Calculate aggregate transportation GHG emissions impacts for RTPs and TIPs;
9. 310 CMR 60.05(8)(a)2.e.: Develop public consultation procedures for aggregate transportation GHG emissions impact 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; and
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, STIPs or projects within 30 days of endorsement to the Department for review of the GHG assessment.



Gina Fiandaca, Secretary and CEO
Massachusetts Department of Transportation (MassDOT);
Chair, Pioneer Valley Metropolitan Planning Organization (PVMPO)

4/25/2023

Date

RTP APPENDIX

A. ACRONYMS LIST

3C - Continuing, Comprehensive, and Cooperative Planning	FAST – Fixing America’s Surface Transportation Act
AADT - Average Annual Daily Traffic	FC - Functional Classification (of roadways)
AASHTO - American Association of State Highway and Transportation Officials	FHA - Federal Housing Administration
ADA - Americans with Disabilities Act (1990)	FHWA - Federal Highway Administration
ADT - Average Daily Traffic	FRCOG - Franklin Regional Council of Governments
AFV - Alternative Fuel Vehicles	FRTA – Franklin Regional Transit Authority
AQ – Air Quality	FTA - Federal Transit Administration
ATR - Automatic Traffic Recorder	FY – Fiscal Year
AVR - Average Vehicle Ridership	FFY – Federal Fiscal Year
BAPAC - Barnes Aquifer Protection Advisory Committee	GHG - Greenhouse Gas
BID - Business Improvement District	GIS - Geographic Information System
BIL – Bipartisan Infrastructure Law	GPS - Global Positioning System
BLOS - Bicycle Level of Service	HOV - High Occupancy Vehicle
BMP - Best Management Practice	HSIP – Highway Safety Improvement Program
BMS - Bridge Management System	HUD - U.S. Department of Housing and Urban Development
CAAA - Clean Air Act Amendments of 1990	IJA – Infrastructure, Investment and Jobs Act
CBD - Central Business District	ISTEA – Intermodal Surface Transportation Efficiency Act
CDBG - Community Development Block Grant	ITS - Intelligent Transportation Systems
CDC - Centers for Disease Control	JARC - Job Access and Reverse Commute
CEDS - Comprehensive Economic Development Strategy	JLSB - Jacob's Ladder Scenic Byway
CIP - Capital Improvements Plan (or Program)	JLT - Jacob's Ladder Trail
CFR – Code of Federal Regulations	JTC - Joint Transportation Committee
CMAQ - Congestion Mitigation and Air Quality Improv. Program	LEP - Limited English Proficiency
CMP - Congestion Management Process	LOS - Level of Service
CNG - Compressed Natural Gas	LPMS - Local Pavement Management System
CO - Carbon Monoxide	LRV - Light Rail Vehicle
COG - Council of Governments	LTA - Local Technical Assistance
Comm-PASS - Commonwealth Procurement Access and Solicitation System	M.G.L. - Massachusetts General Laws
CPA - Community Preservation Act	MAP 21 - Moving Ahead for Progress in the 21st Century
CPTC - Citizen Planner Training Collaborative	MARPA - Massachusetts Assoc. of Regional Planning Agencies
CRCOG - Capitol Region Council of Governments	MassDOT - Massachusetts Department of Transportation
CSO - Combined Sewer Overflow	MassGIS - Massachusetts Geographic Information System
DCR - Department of Conservation and Recreation	MEPA - Massachusetts Environmental Policy Act
DEP - Department of Environmental Protection	MMA - Massachusetts Municipal Association
DHCD - Department of Housing and Community Development	MOA - Memorandum of Agreement
DLTA - District Local Technical Assistance	MOU - Memorandum of Understanding
DOT - Department of Transportation	MPA – Metropolitan Planning Area
DPW - Department of Public Works	MPO - Metropolitan Planning Organization
E.O. - Executive Order	MUTCD - Manual of Uniform Traffic Control Devices
EDC - Economic Development Council	NFA - Non-Federal Aid
EDC – Every Day Counts	NHS - National Highway System
EIR - Environmental Impact Report	NHTSA - National Highway Traffic Safety Administration
EIS - Environmental Impact Statement	NOx - Nitrogen Oxide
EJ - Environmental Justice	NTSB - National Transportation Safety Board
ENF - Environmental Notification Form	OCI - Overall Condition Index (Pavement)
EOA - Economic Opportunity Area	OTP – Office of Transportation Planning (MassDOT)
EEA - Executive Office of Energy and Environmental Affairs	PBPP – Performance Based Planning and Programming
EPA - Environmental Protection Agency	PEB – Potential for Everyday Biking
FA - Federal Aid	PCI - Pavement Condition Index
	PL - [Metropolitan] Planning Funds
	PMS - Pavement Management System

PPP - Public Participation Process/Plan
PTASP – Public Transportation Agency Safety Plan
PVTA - Pioneer Valley Transit Authority
QVCDC - Quaboag Valley Community Development Corp.
REB - Regional Employment Board
RIF - Roadway Inventory Files
RPA - Regional Planning Agency
RTA - Regional Transit Authority
RTP - Regional Transportation Plan
SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SBA - Small Business Administration
SIP - State Implementation Plan (for air quality)
SKC - Sustainable Knowledge Corridor
SOV - Single Occupancy Vehicle
SPR - Statewide Planning and Research Funds
STIP - Statewide Transportation Improvement Program
STP - Surface Transportation Program
TAM – Transit Asset Management
TAZ – Traffic Analysis Zone
TDM - Transportation Demand Management
TEC – Transportation Evaluation Criteria

TIP - Transportation Improvement Program
TMA – Transportation Management Area
TMC - Turning Movement Count
TND - Traditional Neighborhood District
TOD - Transit Oriented Design (or Development)
TRB - Transportation Research Board
TRO - Trip Reduction Ordinance
TSM - Transportation Systems Management
TTTR – Truck Travel Time Reliability
UMass - University of Massachusetts
UPWP - Unified Planning Work Program
USC – United States Code
USDOT – United States Department of Transportation
UZA – Urbanized Area
VMT - Vehicle Miles Traveled
VOC - Volatile Organic Compound
VOR - Vehicle Occupancy Rate
VPI – Virtual Public Involvement
WBE - Women-owned Business Enterprises
WRWA - Westfield River Watershed Association
WRWSAC - Westfield River Wild & Scenic Advisory Committee
ZBA - Zoning Board of Adjustment (or Appeals)

B. DESCRIPTION OF FUNDING SOURCES

Interstate Maintenance (IM) - Resurfacing, restoration and rehabilitation are eligible activities for maintaining Interstate facilities. Reconstruction is also eligible if it does not add capacity. However, high-occupancy-vehicle (HOV) and auxiliary lanes can be added. Funding: federal - 90 %, state - 10 %.

Surface Transportation Block Grant Program (STBG) - This program formerly the Surface Transportation Program (STP) is a flexible funding program that can be used for projects that preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. Funding: federal - 80%, state/Local - 20%.

Transportation Alternatives Program (TAP) - The TAP provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways. Funding: federal - 80%, state - 20%

Congestion Mitigation and Air Quality Improvement Program (CMAQ) - These funds are directed towards transportation projects and programs which reduce transportation-related emissions. These funds are to assist areas

designated as nonattainment and maintenance under the Clean Air Act Amendments of 1990. These projects will contribute to meeting the attainment of National Ambient Air Quality Standards (NAAQS). Funding: federal - 80%, state/Local - 20%.

Highway Safety Improvement Program (HSIP)—The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. The goal of HSIP is 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. Funding: federal - 80%, state - 20%. HSIP federal – 90%, state – 10%.

Bridges (BR) - Funds the replacement or repair of structurally deficient or unsafe bridges in urban and rural areas. All bridges, both on and off the federal aid roadway system are eligible for funding. Funding: federal - 80%, state - 20%.

National Highway Performance Program (NHPP) - The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS. NHPP projects must be on an eligible facility and support progress toward achievement of national performance goals for improving infrastructure condition, safety, mobility, or freight movement on the NHS, and be consistent with Metropolitan and Statewide planning requirements. Funding: federal - 80%, state - 20%.

National Highway Freight Program (NHFP) - The purpose, among other goals, of the National Highway Freight Program (NHFP) is to improve efficient movement of freight on the National Highway Freight Network (NHFN). Funding: federal - 80%, state - 20%.

High Priority Projects (HPP) High Priority Projects are congressionally earmarked projects that have been deemed as a high priority for the state where the project is located. Funding: federal - 80%, state – 20%

Carbon Reduction Program (CRP) – CRP funding is designed for projects designed to reduce emissions related to transportation. Before obligating CRP funds for an eligible project in an urbanized area that is not a transportation management area, a State shall coordinate with any MPO that represents the urbanized area prior to determining which activities should be carried out under the project. Funding: federal - 80%, State – 20%

Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) – Competitive grant focusing on the resiliency of the transportation system. Funding: federal - 80%, State – 20%

Section 115 Funds Included in the Transportation bill as congressional earmarks, each year the earmarks are given a designated funding category. In FFY2005 the funding designation for these projects was Section 115 Funds. Funding: federal – 100%, state – 0%

Section 117 Funds Included in the Transportation bill as congressional earmarks, each year the earmarks are given a designated funding category. In FFY2006 the funding designation for these projects was Section 117 Funds. Funding: federal – 100%, state – 0%

Section 129 Funds Congressional Earmarks for FFY 2008. Funding: federal – 100%, state – 0%

Section 125 Funds Congressional Earmarks for FFY 2009. Funding: federal – 100%, state – 0%

Non-Federal Aid (NFA) - This funding category contains all those projects not receiving federal funds. Various categories of state funding are included in this group including bikeways, State Aid (Chapter 90), and highway construction and maintenance (Chapter 497). This category is included in the TIP for informational purposes only. Funding: federal - 0 %, state - 100 %.

Section 5339 Bus and Bus Facilities – (5309 SAFETEA-LU) Program provides capital funding to replace, rehabilitate, and purchases buses and related equipment and to construct bus related facilities. Funding: Federal - 80%, State - 20%

Section 5307 Capital - This program provides grants to Urbanized Areas¹ (UZA) for public transportation capital, planning, job access and reverse commute projects, as well as operating expenses in certain circumstances. These funds constitute a core investment in the enhancement and revitalization of public transportation systems in the nation's urbanized areas, which depend on public transportation to improve mobility and reduce congestion. Federal Share is 80% for Capital Assistance, 50% for Operating Assistance, and 80% for Americans with Disabilities Act (ADA) no-fixed-route paratransit service, using up to 10% of a recipient's apportionment.

Section 5310 - Section 10 pertains to transportation facilities meeting special needs of the elderly and disabled. Funds allocated under Section 16(b) (2) provide private non-profit corporations and associations with grants and loans to improve the mobility of the elderly and disabled. In Massachusetts, 16(b) (2) funds are administered at the state level by the MASSDOT. These funds typically are used for the purchase of capital items, including lift-equipped vans. Mobility Assistance Program (MAP) funds are intended for use by public agencies, such as municipal councils on aging and the Pioneer Valley Transit Authority (PVTA) to provide van service to elderly and/or disabled persons.

Section 5311 - These funds are made available exclusively for public transportation projects outside the urbanized areas. Both capital and operating expenses are eligible.

C. PUBLIC PARTICIPATION SUMMARIES

PVPC held a series of outreach events during the RTP Public Participation Process. The following event summaries are provided to add additional context based on staff conversations with attendees that did not wish to submit a formal written comment.

a) Westfield Farmer’s Market - June 29th, 2023

Huntington Resident – There is a considerable need for additional paratransit services in the Hilltowns, especially for seniors. As we grow older, mobility plays a big part in our mental and physical health. Seniors need transportation opportunities to continue to live independently and productively.

Westfield Resident - The residents of Westfield need transportation officials and the people in charge to finish building the connecting pieces of the Westfield bike path network. These bike paths are needed to make safe connections and we have waited a long time.

Goshen Resident - Transportation for seniors does not get enough attention. We need to prioritize our resources to make sure that seniors can get to doctor appointments and run errands and get groceries and other essentials. I chose to retire here because this is a beautiful place to live, and I want to continue living here into my old age.

Westfield Resident - While I appreciate the attention that everyone is giving to passenger rail service, I don’t think that it would be a good thing for the average resident. I’m afraid that passenger rail may drive up already expensive housing and take away opportunities for first time home buyers and driving up rents for people that cannot afford or do not feel the need to own a home.

Westfield State University Student – We need an electric bikeshare system that would allow students, faculty, and staff to ride from the WSU campus into the city center. This connection would make a lot of sense. Other places have bikeshare and college/university communities are popular places for biking. I would ride a bike now that the roads like Western Ave are getting better with places for bikes.

Westfield Resident – I don’t feel safe bicycling around Westfield. The streets are not safe. I prefer to go “up north” to ride on the bike trails and quieter roads.

Granville Resident - Transportation folks need to place greater emphasis on rural roads and dirt roads. Our dirt/gravel roads are expensive to maintain, and rural

towns don't have a lot of resources. Dirt roads don't get the same amount of attention as paved roads in more urban areas. But residents in Granville are greatly impacted by the closure of dirt roads. I live on Beach Hill Road and a logging truck that was too large to be using the road wrecked a bridge. With the bridge out, we have a very long commute to town and are cut off from other services. Hopefully your document will address the need to plan for ways to maintain dirt roads in rural areas, not just focus on cities. When a city street closes, you typically don't have a 45-minute detour.

Westfield Resident – Lockhouse Road in Westfield needs sidewalks and a safe way to bike. There are many places to walk to on Lockhouse Road if we had a safe way to get there. Drivers go too fast on Lockhouse and it's not safe to walk or bike. There is room along Lockhouse for sidewalks.

b) Holyoke Armour Yard - July 17, 2023

By far the majority of comments focused on commuter rail and the potential for additional east/west service connecting Springfield to Boston. Many comments focused on when and how this could happen. A number of people responded that commuter rail only made sense if it was affordably priced. One person commented they work in Boston and would love the opportunity to use the train to commute to work when not working from home. There were not any negative comments on east/west rail service.

Two members of Holyoke Rows expressed a desire for better connections to their site on 25 Jones Ferry Road in Holyoke, MA. They offer many after school programs – specifically to Holyoke High School. While there is a bus that can drop students off near their location, there are not adequate sidewalks along Main Street to completely and safely connect to Jones Ferry Road. PVPC staff encouraged both people to submit a written comment via email in order to correctly convey their concerns.

A woman that works in personnel for Yankee Candle in Deerfield, MA asked for transit service from Springfield to their Deerfield location. There is not any existing transit service and many workers have difficulty getting to work as they do not own a car. It is also difficult to recruit staff (many current job openings) due to the lack of alternate means of transportation to their site.

One woman expressed a desire for more bus service from Western Massachusetts to Boston.

There was a question on when the Mass Central rail trail will be completed as they have a strong desire to ride a bicycle to Boston.



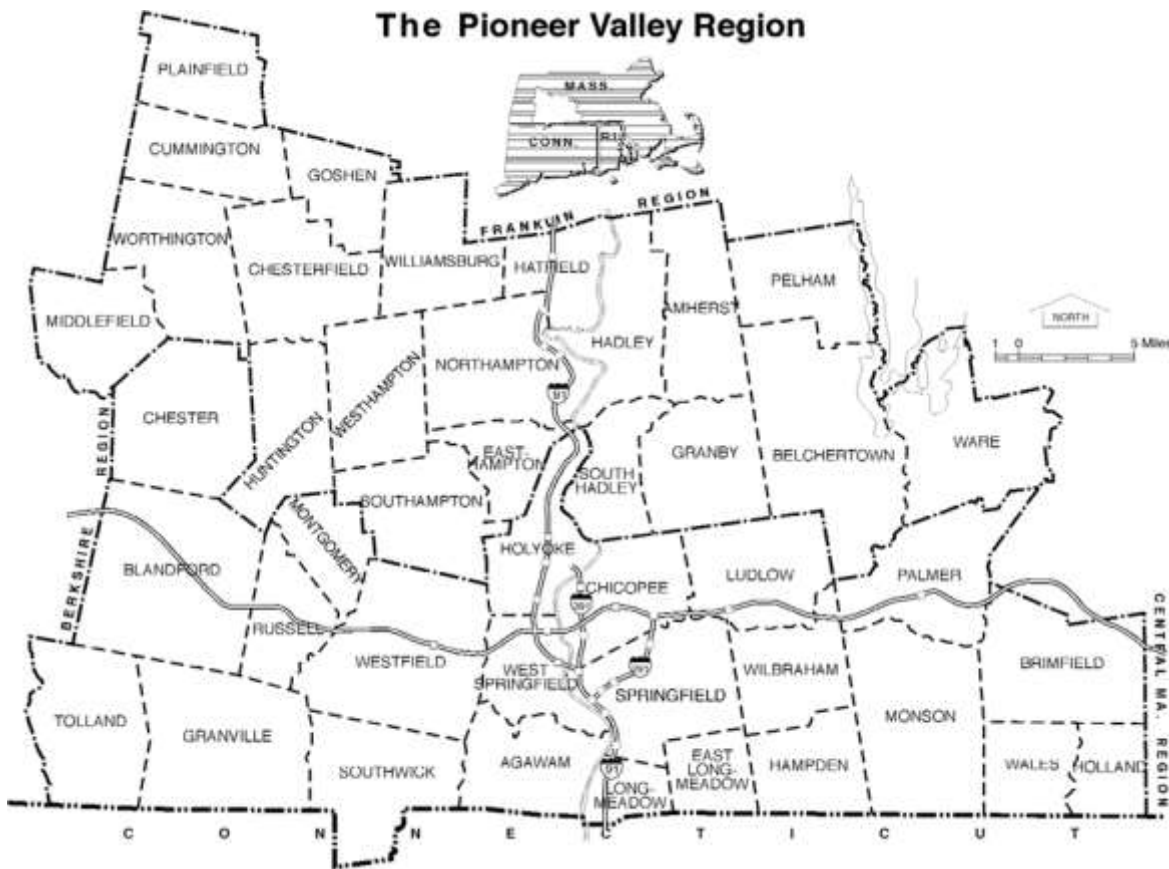
CHAPTER 5 - REGIONAL PROFILE APPENDIX

Social and economic trends can have significant implications on transportation planning. This chapter presents a profile of the region's physical, socioeconomic, demographic and environmental characteristics as they relate to transportation planning and construction.

D. PHYSICAL CHARACTERISTICS

The Pioneer Valley Region is located in the Midwestern section of Massachusetts. Encompassing the fourth largest metropolitan area in New England, the region covers 1,179 square miles. The Pioneer Valley is bisected by the Connecticut River and is bounded on the north by Franklin County, on the south by the State of Connecticut, on the east by Quabbin Reservoir and Worcester County and on the west by Berkshire County.

Figure A5-1 – The Pioneer Valley Region Map
The Pioneer Valley Region



The Pioneer Valley Region, which is comprised of the 43 cities and towns within the Hampden and Hampshire County areas, is home to more than 628,000 people. Hampden County, the most populous of the four western counties of Massachusetts, is approximately 635 square miles. Hampden County is made up of 23 communities including the Springfield-Chicopee-Holyoke urbanized area. Hampshire County is situated in the middle of Western Massachusetts and includes an area of 544 square miles.

Springfield is the region's largest city and its cultural and economic center. Several of the region's largest employers are located in Springfield including Massachusetts Mutual Life Insurance Company, Baystate Medical Center, Mercy Hospital Incorporated, Smith & Wesson Company, and the MGM Casino. Major cultural institutions include the Springfield Symphony, MassMutual Center, Quadrangle Museums, the Basketball Hall of Fame, and the Dr. Seuss National Memorial Sculpture Garden.

The cities of Chicopee and Holyoke were the first planned industrial communities in the nation. Merchants built an elaborate complex of mills, workers' housing, dams, and canal systems that evolved into cities. While many historic mills and industries are now gone, a number of 19th and 20th

century structures are maintained and improved through municipal preservation and revitalization initiatives.

Unique within the Commonwealth of Massachusetts, the Pioneer Valley region contains a diverse economic base, internationally known educational institutions, and limitless scenic beauty. Dominant physical characteristics include the broad fertile agricultural valley formed by the Connecticut River, the Holyoke Mountain range that traverses the region from Southwick to Pelham, and the foothills of the Berkshire Mountains. Prime agricultural land, significant wetlands, and scenic rivers are some of the region’s premier natural resources. Choices in lifestyle range from contemporary downtown living to stately historic homes, characteristic suburban neighborhoods, and rural living in very small communities—a variety that contributes to the diversity and appeal of the region. Its unique combination of natural beauty, cultural amenities, and historical character make the Pioneer Valley region an exceptional environment in which to live and work.

E. HIGHWAY

1. Access

The Pioneer Valley area is considered the crossroads of transportation in Western Massachusetts. Situated at the intersection of the area's major highways, Interstate 90 (Massachusetts Turnpike) traveling east-west and Interstate 91 traveling north-south, the region offers easy access to all markets in the Eastern United States and Canada. Major southern New England population centers are accessible within hours.

Table A5-1 - Driving Distance and Time from Springfield

Destination	Distance	Time
Albany, NY	85 miles	1.5 hours
Boston, MA	91 miles	1.5 hours
New York City, NY	140 miles	3.0 hours
Philadelphia, PA	260 miles	5.0 hours
Montreal, Quebec	301 miles	5.5 hours
Washington DC	400 miles	8.0 hours

The interstate expressways (I-90/I-91) link most of the major urban centers in the region. The basic highway network including interstate highways, U.S. numbered routes and state routes, along with other traffic arteries, provides access to all municipalities in the region, both urban and rural. An exit renumbering project was completed by MassDOT in 2021. All highway exits were renumbered to comply with federal regulations and match mile markers. [Statewide Exit Renumbering Project Details | Mass.gov](#).

Table A5-2 – Regional Interstate Highways

Interstate Highways	Principal Orientation	# of In- Region Interchanges	In-Region Mileage	Toll Road?
I-90	East/West (Mass. Turnpike)	6	46.08	Yes
I-91	North/South	22	31.17	No
I-291	Connector (Springfield to I-90)	6	5.44	No
I-391	Connector (I-91 to Chicopee/Holyoke)	6	3.82	No

The highway network is composed of various facilities that are separated into systems within the federal-aid highway program by the Massachusetts Highway Department on the basis of their functional classification which takes into account the various functions and uses of the roads. The federal-aid highway program in Massachusetts is a state administered program. The program consists of three separate federal aid systems, the National Highway System (NHS), the Interstate System and the Surface Transportation Program.

2. Functional Classification

The Federal-Aid Highway Act of 1973 required the use of functional highway classification to update the Federal-Aid Highway system and identify the National Highway System. Both of these highway systems are used as inventory mechanisms and funding eligibility criteria for our nation's roadway network.

The region's roadways are grouped into classes according to the service they are intended to provide. The region's urbanized area is defined by the U.S. Census. The seven functional roadway classifications adopted by Massachusetts are summarized below:

Interstate - Freeways service as principal arterials providing service to substantial statewide and interstate travel.

Rural Principal Arterials - Major highways that serve corridor movements having trip length and travel density characteristics that indicate substantial statewide or interstate travel. Principal Arterials include the Interstate system.

Rural Minor Arterial - Roadways with statewide significance that link cities and large towns forming an integrated network of intracounty importance.

Rural Major Collectors and Urban Minor Arterials - Those roads that provide service to cities, towns and other traffic generators not served by the arterial system; roads that link these places with the arterial system; and roads that serve the more important intracounty travel corridors.

Rural Minor Collectors and Urban Collectors - Roads that bring traffic from local roads to collector roads; roads that provide service to small communities and link local traffic generators to the rural areas.

Local Roads - Roads that provide access to adjacent land; roads that provide service for relatively short distances. Local roads include all roads not classified as part of the principal arterial, minor arterial, or collector system.

Other Urban Principle Arterials - Roadways with significance that service access to and within the urbanized area. Connections to interstate and rural principle arterials are typical.

Table 5-3 summarizes the roadway mile by functional classification for each community. The functional classification of a roadway may be upgraded or downgraded based on changes in land use, population, and vehicular volume. Communities can request a change in the functional classification through a written request to the PVPC. If PVPC concurs that a change is warranted, the request is submitted to MassDOT Planning for their approval. Once approved by MassDOT, the change requires endorsement by both the MPO and the FHWA before the functional classification can be officially changed.

3. Jurisdiction

There are over 4,400 miles of road in the region. As of 2020, city and town governments administered 82 percent of the road miles and the MassDOT was responsible for approximately 7.6 percent. The Massachusetts Turnpike Authority, the Department of Conservation and Recreation, the Federal Government, various park systems and the state colleges and universities administered a small number of roadway miles. Table 5-4 gives an inventory of the region's roadway miles according to the governmental unit responsible for maintaining them.

Table A5-3 – Miles of Roadway by Community and Functional Classification

Community	Functional Classification						
	Total	Interstates	Urban Arterials	Rural Arterials	Urban Collectors	Rural Collectors	Local Roads
Agawam	160.1	0.0	29.2	0.0	27.8	0.0	103.2
Amherst	138.0	0.0	42.0	0.0	5.2	1.5	89.3
Belchertown	163.4	0.0	25.8	7.5	9.4	8.7	112.0
Blandford	86.4	8.4	0.0	0.0	0.0	33.7	44.4
Brimfield	79.0	3.0	0.0	8.8	0.0	17.0	50.2
Chester	67.2	0.0	0.0	6.4	0.0	22.0	38.8
Chesterfield	58.3	0.0	0.0	7.8	0.0	15.6	34.9
Chicopee	262.6	11.6	40.0	0.0	15.6	0.0	195.4
Cummington	61.1	0.0	0.0	12.9	0.0	9.4	38.8
East Longmeadow	100.9	0.0	21.5	0.0	9.4	0.0	70.0
Easthampton	92.5	0.5	25.7	0.0	5.0	0.0	61.4
Goshen	42.1	0.0	0.0	5.4	0.0	8.2	28.4
Granby	68.8	0.0	16.9	1.0	12.3	6.0	32.6
Granville	73.0	0.0	0.0	8.9	0.0	17.3	46.8
Hadley	80.1	0.0	19.0	4.1	4.3	10.9	41.9
Hampden	55.1	0.0	5.8	0.0	2.5	7.3	39.5
Hatfield	59.7	3.8	4.4	0.0	0.0	10.2	41.3
Holland	38.3	0.1	0.0	0.0	0.0	12.0	26.3
Holyoke	177.3	9.9	38.5	0.0	20.9	0.0	108.0
Huntington	54.7	0.0	0.0	11.3	0.0	12.0	31.5
Longmeadow	100.8	3.3	14.3	0.0	5.0	0.0	78.4
Ludlow	137.5	5.7	25.0	0.0	10.0	1.6	95.2
Middlefield	38.3	0.0	0.0	0.0	0.0	7.5	30.9
Monson	110.1	0.0	13.1	3.3	0.9	16.9	75.9
Montgomery	31.2	0.1	0.0	0.0	0.0	8.2	22.9
Northampton	181.8	6.0	48.3	0.0	16.1	0.0	111.3
Palmer	117.9	7.4	30.7	1.6	7.1	9.1	62.0
Pelham	45.8	0.0	2.7	5.7	0.0	8.4	29.0
Plainfield	48.1	0.0	0.0	0.0	0.0	17.6	30.5
Russell	35.8	3.9	7.7	0.0	1.3	6.8	16.2
South Hadley	103.9	0.0	17.8	0.0	10.2	0.0	75.9
Southampton	77.4	0.0	9.3	0.0	7.9	1.4	58.8
Southwick	90.2	0.0	16.3	2.8	10.8	7.7	52.6
Springfield	506.0	10.5	99.4	0.0	46.6	0.0	349.4
Tolland	41.4	0.0	0.0	5.7	0.0	5.3	30.4
Wales	28.5	0.0	0.3	0.0	0.0	12.5	15.6
Ware	116.9	0.0	13.8	4.8	9.0	5.5	83.8
West Springfield	146.5	6.2	30.3	0.0	8.9	0.0	101.1
Westfield	249.5	6.6	46.8	0.0	20.0	0.0	176.1
Westhampton	47.3	0.0	0.2	0.0	0.0	22.0	25.1
Wilbraham	113.4	1.1	20.5	0.0	12.4	4.6	74.9
Williamsburg	50.9	0.0	2.7	7.0	0.0	12.9	28.3
Worthington	64.9	0.0	0.0	10.3	0.0	10.6	44.0
Pioneer Valley Region	4,402.4	88.0	668.1	115.1	278.2	350.3	2,902.7

Source: MassDOT

Table A5-4 – Miles of Roadway by Community and Administrative Unit

Community	Total	Mass DOT	City/Town Accepted	DCR	State Park	State Institutional	Unaccepted	Combined Federal
Agawam	160.1	14.2	129.9	0.0	4.1	0.0	11.9	0.0
Amherst	138.0	5.4	99.9	0.0	0.0	8.0	24.7	0.0
Belchertown	163.4	15.2	128.4	8.0	0.0	2.0	9.7	0.0
Blandford	86.4	18.1	64.1	0.0	3.5	0.0	0.7	0.0
Brimfield	79.0	14.7	64.0	0.0	0.0	0.0	0.3	0.0
Chester	67.2	6.5	57.7	0.0	1.1	0.0	1.9	0.0
Chesterfield	58.3	0.1	53.1	0.0	0.3	0.0	4.9	0.0
Chicopee	262.6	17.6	191.6	0.0	1.6	0.0	35.9	16.0
Cummington	61.1	9.6	48.5	0.0	0.0	0.0	2.3	0.7
East Longmeadow	100.9	0.0	98.4	0.0	0.0	0.0	2.5	0.0
Easthampton	92.5	2.9	83.6	0.0	2.3	0.0	3.7	0.0
Goshen	42.1	7.2	24.9	0.0	4.9	0.0	5.1	0.0
Granby	68.8	7.7	58.0	0.2	0.0	0.0	2.9	0.0
Granville	73.0	0.1	64.2	0.0	1.2	0.0	7.5	0.0
Hadley	80.1	8.7	65.3	0.0	1.2	3.6	1.4	0.0
Hampden	55.1	0.0	53.9	0.0	0.0	0.0	1.1	0.0
Hatfield	59.7	7.6	50.2	0.0	0.0	0.0	1.9	0.0
Holland	38.4	0.1	35.9	0.0	0.0	0.0	2.4	0.0
Holyoke	177.3	17.4	133.3	0.0	5.3	1.8	19.5	0.0
Huntington	54.7	11.8	36.6	0.0	0.0	0.0	2.7	3.6
Longmeadow	100.9	3.3	84.8	0.0	0.0	0.0	12.8	0.0
Ludlow	137.5	6.0	123.5	0.1	0.4	0.9	6.7	0.0
Middlefield	38.3	0.0	38.3	0.0	0.0	0.0	0.0	0.0
Monson	110.1	7.1	100.3	0.02	0.0	0.7	2.0	0.0
Montgomery	31.2	0.1	30.4	0.0	0.0	0.0	0.7	0.0
Northampton	181.8	13.4	154.3	0.0	0.0	2.1	10.2	1.8
Palmer	117.9	23.2	86.9	0.0	0.0	0.0	7.8	0.0
Pelham	45.8	5.7	22.8	14.6	0.8	0.0	1.9	0.0
Plainfield	48.1	0.0	47.3	0.0	0.0	0.0	0.8	0.0
Russell	35.8	13.3	22.3	0.0	0.0	0.0	0.1	0.0
South Hadley	103.9	8.8	84.5	0.0	0.6	0.0	10.1	0.0
Southampton	77.4	5.4	68.2	0.0	0.0	0.0	3.8	0.0
Southwick	90.2	7.2	73.8	0.0	0.0	0.0	9.2	0.0
Springfield	506.0	12.3	444.5	0.0	6.7	1.6	40.9	0.0
Tolland	41.4	0.2	39.1	0.0	1.6	0.0	0.5	0.0
Wales	28.5	5.1	23.4	0.0	0.0	0.0	0.0	0.0
Ware	116.9	11.0	85.5	17.2	0.0	0.0	3.1	0.0
West Springfield	146.4	15.1	121.4	0.0	0.0	0.0	10.0	0.0
Westfield	249.5	16.2	189.8	0.0	0.0	0.4	43.2	0.0
Westhampton	47.3	0.01	43.8	0.0	0.0	0.0	3.5	0.0
Wilbraham	113.4	6.2	100.2	0.0	0.0	0.0	7.1	0.0
Williamsburg	50.9	5.7	42.6	0.0	0.0	0.0	2.6	0.0
Worthington	64.9	6.0	57.4	0.0	0.2	0.0	1.4	0.0
Pioneer Valley Region	4,402.4	336.0	3,626.3	40.0	35.7	21.0	321.3	22.1

Source: MassDOT

4. Vehicle Miles Traveled

Traffic on the region's roadways has been increasing during the last two decades (Figure 5-2.) In the period between 2004 and 2014, the estimated number of average daily vehicle miles traveled (DVMT) in the Pioneer Valley Region experienced periods of fluctuation between increase and decline. However, there was an overall increase of 784,000 vehicle miles per average weekday between 2004 and 2014. A decrease of 228,000 in DVMT was estimated in 2015 followed by a steady increase in DVMT until 2020. There was a major decrease in traffic during the pandemic year in 2020. DVMT totals have started to increase in 2021. The estimated drop in traffic between 2019 and 2020 was 2,553,000. The estimated increase in traffic between 2020 and 2021 was 1,615,000. Traffic is expected to continue increasing in future years and resume its historic upward trends.

The annual total VMT values presented below come from MassDOT's latest VMT estimates as used in the Safety Performance Targets data spreadsheet that was updated in November 2022. The Average Daily VMT values presented below were calculated by dividing the Annual Total VMT values by 365 days.

Figure A5-2 – Estimated Daily Vehicle Miles Traveled

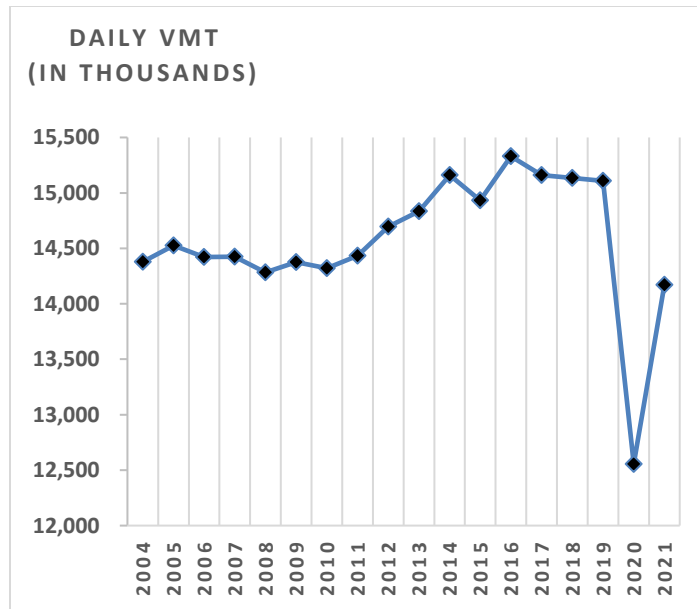


Table A5-5 – 2004 - 2021 Estimated Daily Vehicle Miles of Travel in the Pioneer Valley

Year	Annual VMT (in 100,000,000)	Annual VMT (in 1,000)	Daily VMT (in 1,000)
2004	52	5,247,659	14,377
2005	53	5,302,084	14,526
2006	53	5,263,977	14,422
2007	53	5,264,507	14,423
2008	52	5,213,001	14,282
2009	52	5,247,493	14,377
2010	52	5,227,030	14,321
2011	53	5,268,355	14,434
2012	54	5,364,037	14,696
2013	54	5,414,449	14,834
2014	55	5,533,812	15,161
2015	55	5,450,685	14,933
2016	56	5,595,378	15,330
2017	55	5,533,931	15,161
2018	55	5,524,338	15,135
2019	55	5,514,744	15,109
2020	46	4,582,982	12,556
2021	52	5,172,585	14,171

Source: Massachusetts State HPMS (Highway Performance Monitoring System) Submittals to FHWA

5. Average Daily Traffic Counts

The Pioneer Valley Planning Commission (PVPC) monitors traffic levels throughout the Region. Conducting over 100 roadway segment counts annually as well as compiling counts from various local traffic studies; the PVPC continuously expands the database. This information is used to measure Average Daily Traffic (ADT), Daily Vehicle Miles Traveled (DVMT), and identify seasonal, daily and hourly trends related to vehicle travel.

In addition to the selective ground counts conducted throughout the region, there are nineteen permanent monitoring stations maintained by MassDOT. The MassDOT locations collect counts hourly, 365 days a year. These permanent count locations are shown in Table 5-6.

Table A5-6 – MassDOT Permanent Count Stations in the Pioneer Valley

Location ID	Community	Roadway	Location
26	Longmeadow	I-91	S/O Springfield City Line
33	Chicopee	I-391	S/O I-90 at Route 116
37	Chicopee	I-391	N/O I-90
2163	Chicopee	I-391	@ Connecticut River Bridge
2252	Chicopee	I-391	N/O I-91
11	Northampton	Route 5/10	S/O Hatfield Town Line
2405	Northampton	I-91	N/O King Street Interchange
2425	Northampton	I-91	BTW. Route 9 & Damon Road
2436	Northampton	I-91	BTW. Rts. 5 & 9
31	Springfield	I-291	S/O Roosevelt Avenue
2251	Springfield	I-291	@Chicopee C.L.
2248	Springfield	I-291	W/O Saint James Avenue
3329	Brimfield	Route 20	.8 km E/O Holland Road
280	West Springfield	Route 5	at the Holyoke City Line
2797	West Springfield	I-91	N/O Route 5
130	Huntington	Route 112	S/O Route 66/112
2164	Goshen	Route 112	0.6 km S/O Ashfield Town Line
1180	Russell	Route 20	1.0 km W/O Route 23
2396	Hatfield	I-91	N/O Chestnut Street

Source: mhd.ms2soft.com

Table 5-7 provides information on the percent change in traffic volumes at the above-mentioned count locations. By examining the change in traffic volumes at the permanent count stations, information can be developed on the amount of growth occurring at specific locations throughout the region. Locations have been grouped by the functional classification of the roadway and are shown in Figures 5-3 through 5-7. As can be seen from Table 5-7 most permanent count stations have experienced a significant decrease in volume over the last 10 years. This demonstrates the impact of the COVID-19 pandemic on daily traffic during the 2020 calendar year.

Prior to the 2020 calendar year, traffic volumes in the region remained fairly steady over the past decade. Figures 5-3 – 5-7 clearly illustrate the dramatic decrease in traffic volume due to the pandemic and resulting government shut down in the spring of 2020.

Table A5-7 – Percent Change in Interstate Highway Traffic Volumes

Community	Roadway	Location	Range	% Change
Longmeadow	I-91	S/O Springfield City Line	2010-2020	10.94%
Northampton	I-91	2010-2020	2010-2020	-15.18%
Northampton	I-91	BTW. Route 9 & Damon Road	2010-2020	11.64%
Northampton	I-91	BTW. Rts. 5 & 9	2010-2020	-15.59%
West Springfield	I-91	N/O Route 5	2010-2020	-16.94%
Hatfield	I-91	N/O Chestnut Street	2010-2020	-2.73%
Springfield	I-291	S/O Roosevelt Avenue	2010-2020	-13.76%
Springfield	I-291	@Chicopee C.L.	2010-2020	-12.51%
Springfield	I-291	W/O Saint James Avenue	2010-2020	-8.66%
Chicopee	I-391	S/O I-90 at Route 116	2010-2020	-5.76%
Chicopee	I-391	@ Connecticut River Bridge	2010-2020	-7.04%
Chicopee	I-391	N/O I-90	2010-2020	-9.97%
Chicopee	I-391	N/O I-91	2010-2020	-9.97%

Figure A5-3 – Average Annual Traffic for I-91

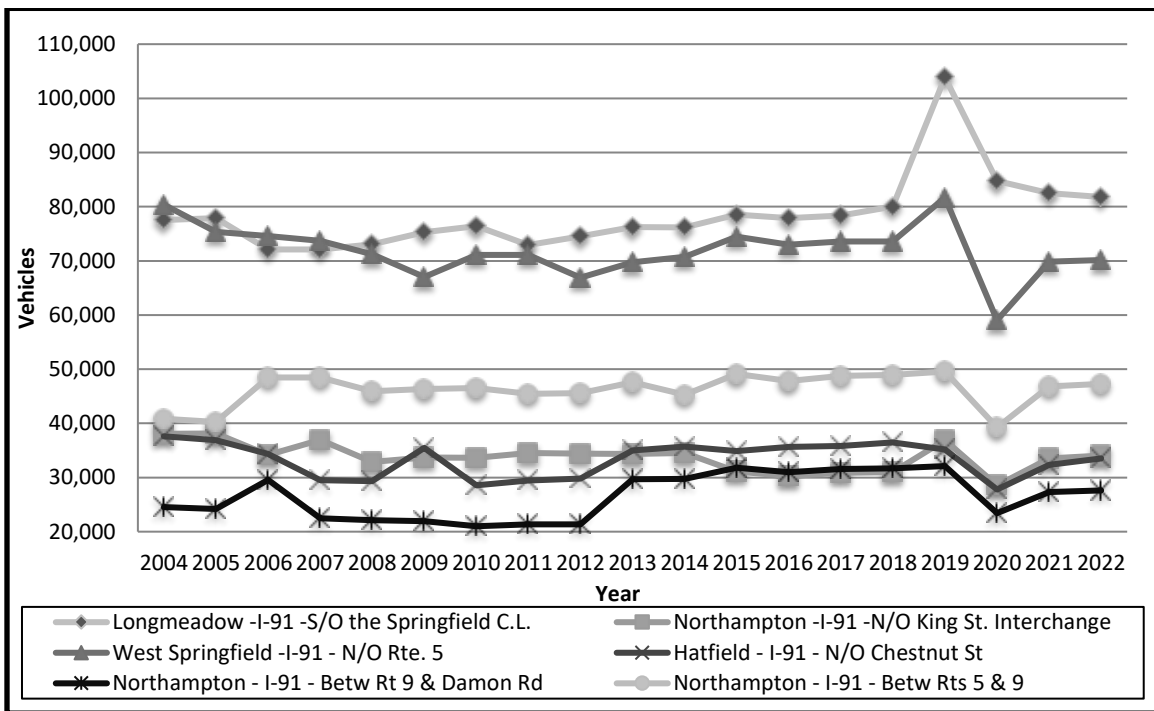


Figure A5-4 – Average Annual Traffic for I-391

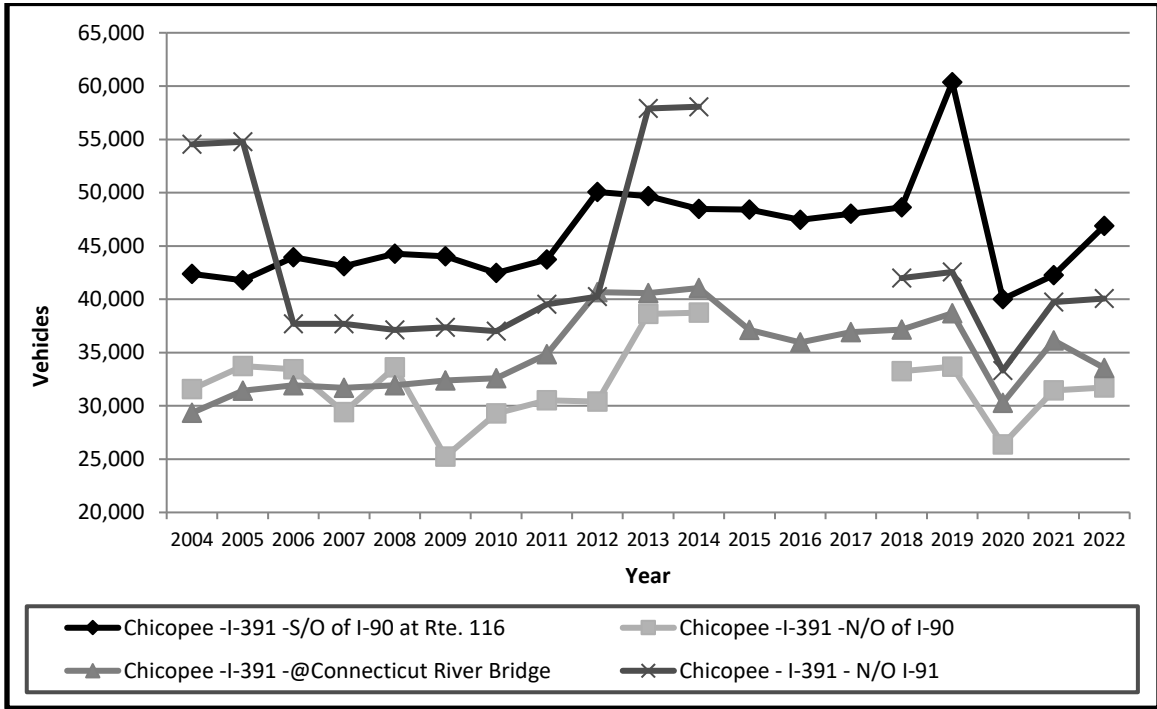


Figure A5-5 – Average Annual Traffic for I-291

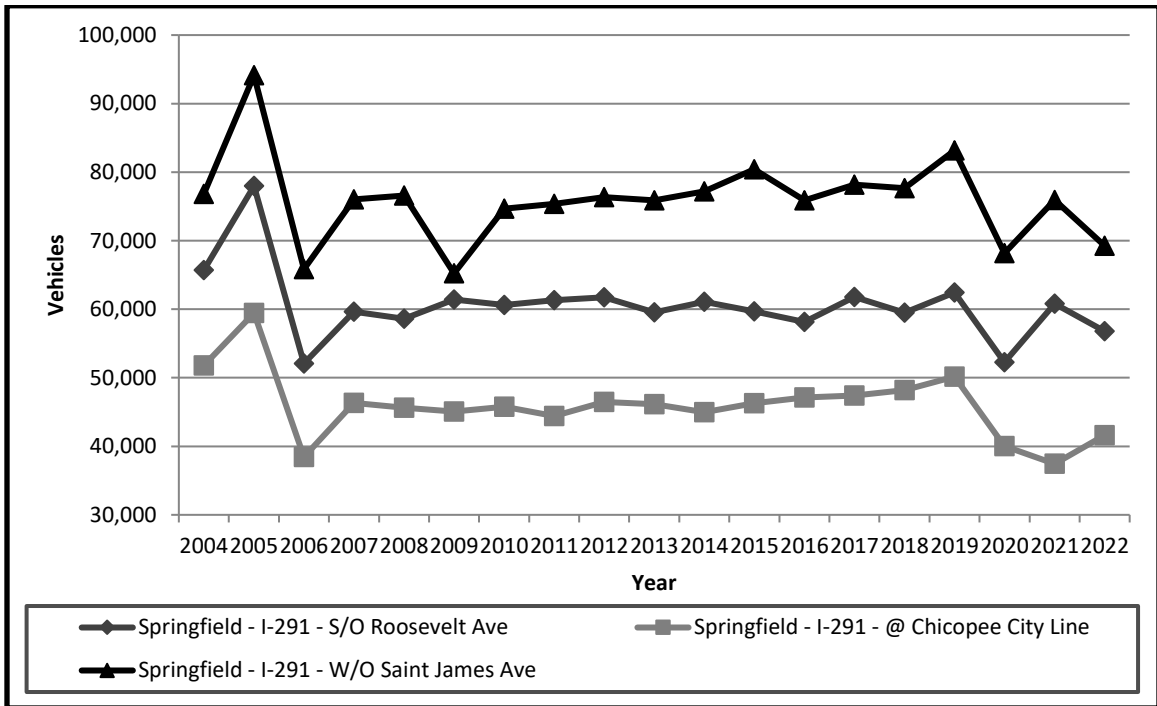


Figure A5-6 – Average Annual Daily Traffic for Urban Arterial Roadways

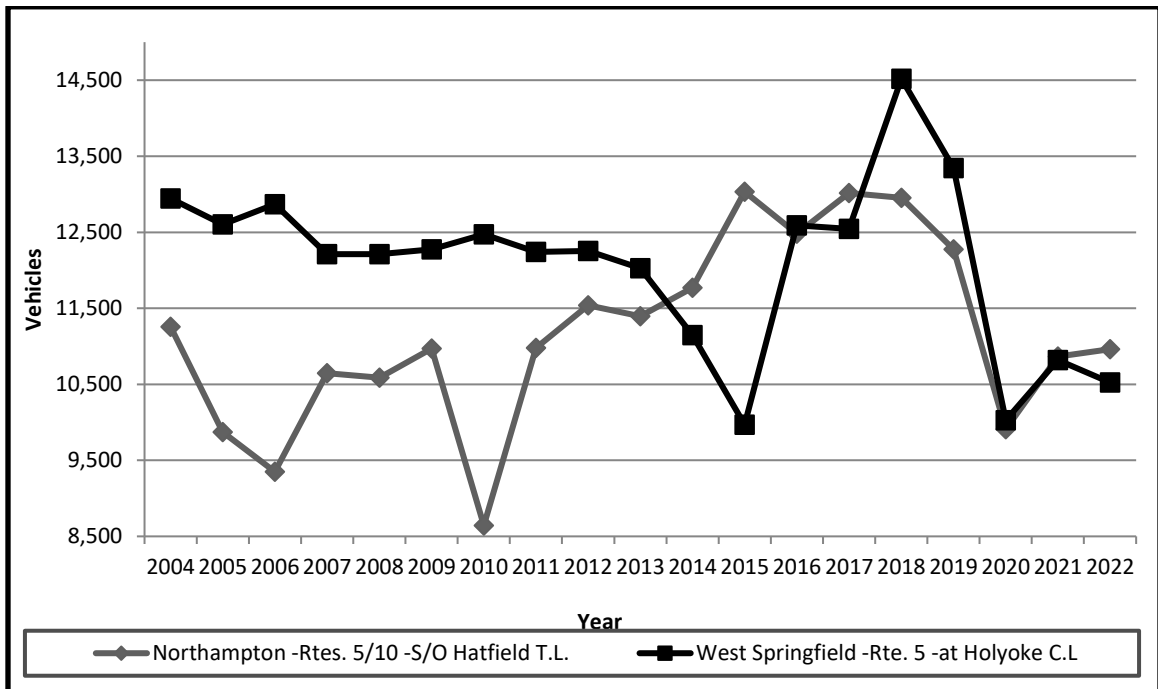
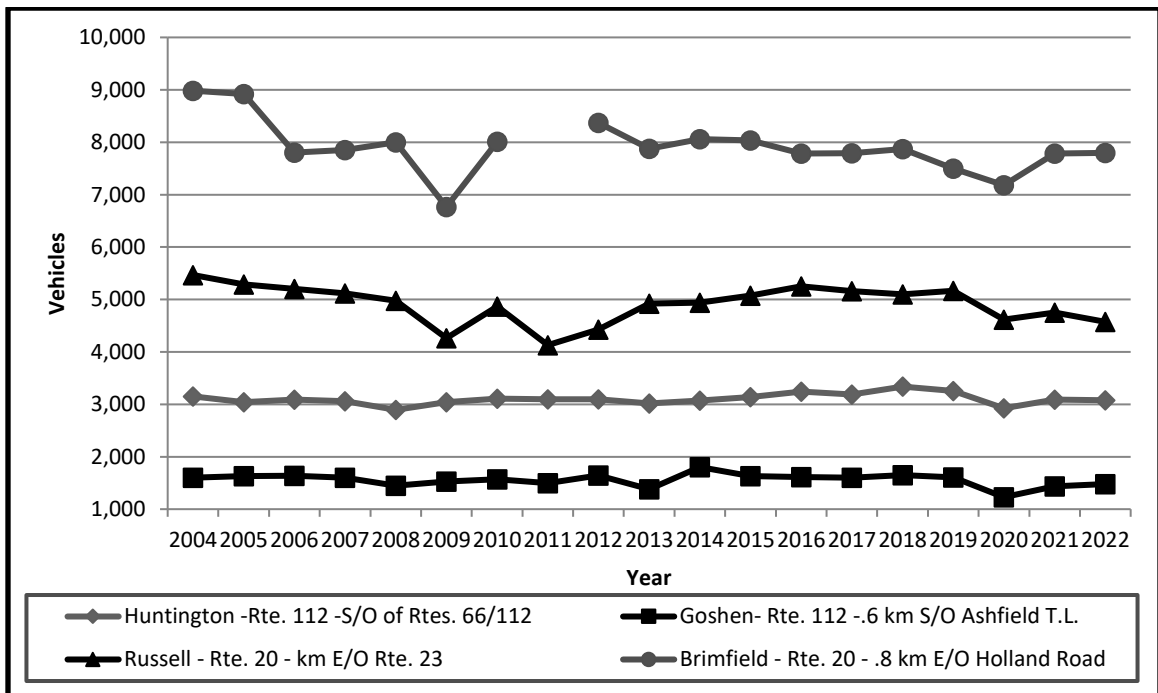


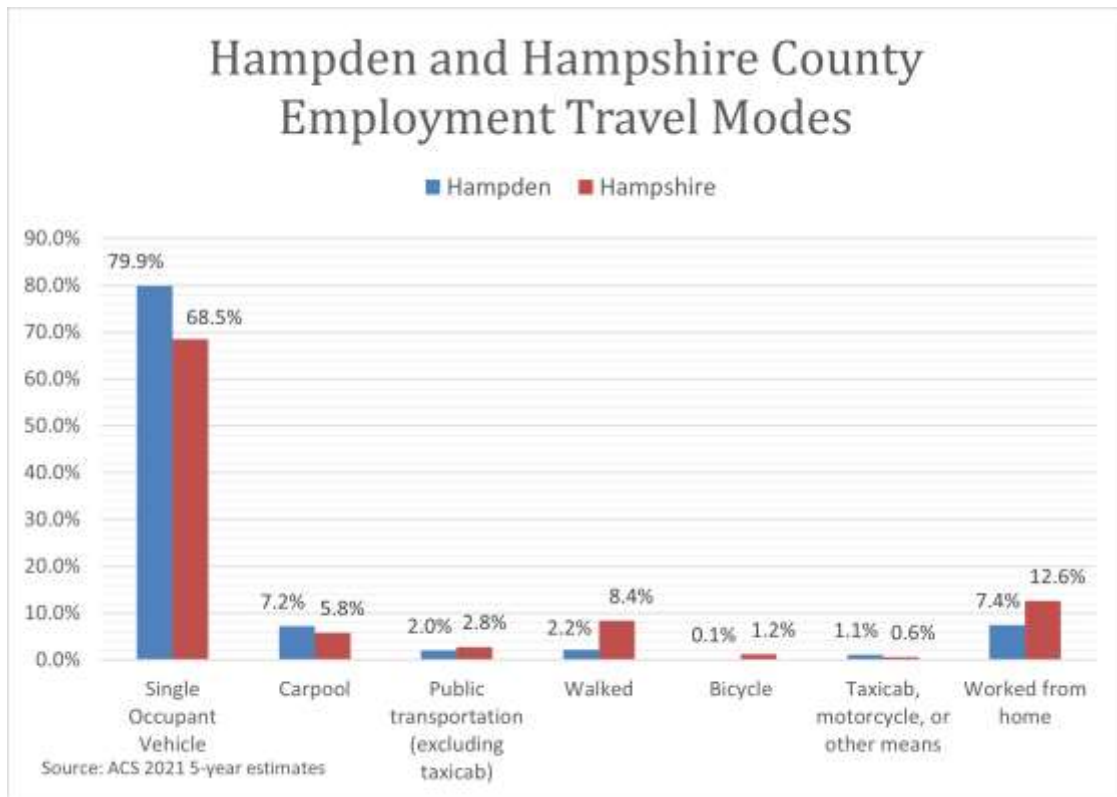
Figure A5-7 – Average Annual Daily Traffic for Rural Roadways



6. Mode Share

Information on mode share data was obtained from the 2021 American Community Survey (table s0801) and the data reflects the 5-year average of commuting trends for employment purposes. The data is broken down by county and shown in Figure 5-8. Approximately 79% of commuters in Hampden County drive alone to work while only 4.3% walk, bicycle or take public transit. In contrast, 69% of commuters in Hampshire County drive alone to work while 12.4% walk, bicycle or take public transit. One reason may be a result of the commuting patterns of the students and faculty that attend the University of Massachusetts in Amherst who may have more travel options.

Figure A5-8 – 2021 Hampden/Hampshire County Employment Travel Modes



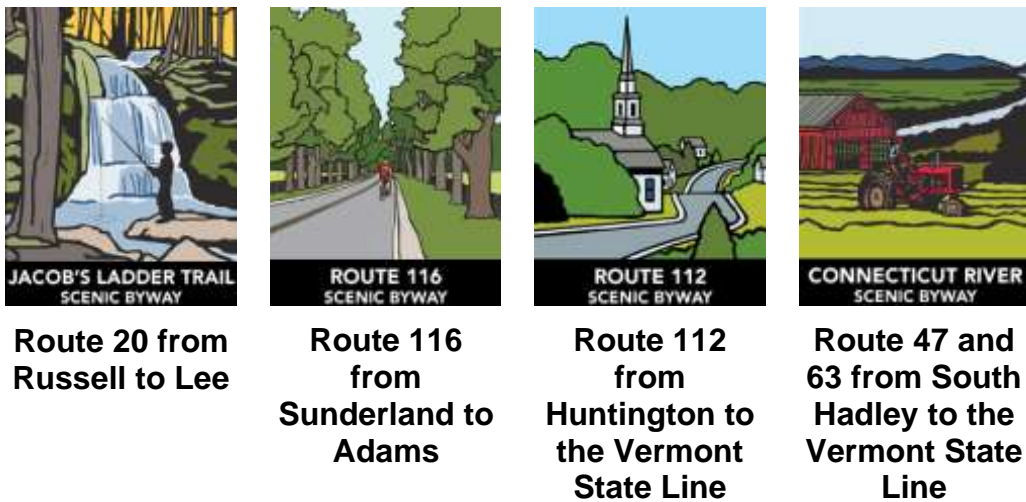
The most significant shift in travel behavior is an increase in the number of people working from home. Work from home almost doubled (185% /180%) in Hampden and Hampshire County. Many employers have incorporated work-from-home alternatives and have kept them in place. Work trips are predominantly a weekday activity, tied to the morning and evening hours, and have historically defined peak travel demand. This influences the design of the transportation infrastructure and helps determine the corridors served and the levels of transit service available. While work trips are often the longest

trip of the day, work trips continue to be a shrinking share of overall trips. Trips for non-work activities continue to increase faster than work trips—there are more trips for family and personal errands, shopping, and social and recreational purposes. Work trips have decreased from 25 percent of all trips in 1969 to 17 percent in 2017. Because non-work trips are shorter (12.2 vs 7.8 miles), they have a greater potential to become walking or bicycle trips.

7. Scenic Byways

The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration. The program is a collaborative effort to help recognize, preserve and enhance selected roads throughout the United States. Projects included in this program focus on the betterment of the services and facilities that attract and please the traveling public. The PVPC has taken an active role in the development of planning studies and project development to support the preservation of scenic roadways in the Pioneer Valley region. There are currently four designated scenic byways in the Pioneer Valley Region.

Figure A5-9 – Scenic Byways in the Pioneer Valley Region



**Route 20 from
Russell to Lee**

**Route 116
from
Sunderland to
Adams**

**Route 112
from
Huntington to
the Vermont
State Line**

**Route 47 and
63 from South
Hadley to the
Vermont State
Line**

More information on scenic byways, including an interactive mapping tool, in the Pioneer Valley region is available at: <http://www.bywayswestmass.com/>.

F. PASSENGER TRANSPORTATION

The Pioneer Valley provides an extensive transit system that offers many different modes of public transportation. Intra-county and Intercity buses, van service for seniors and disabled riders, ridesharing, and park and ride lots are

all vital to the mobility of the region's residents. What follows is a summary of these services.

- Public buses operating on fixed routes and schedules.
- Vans for disabled residents and senior citizens better known as Paratransit.
- Commercial scheduled bus service within the region, as well as to destinations beyond the region
- Commercial and non-profit van shuttles, charter buses and taxis
- Passenger rail

1. Pioneer Valley Transit Authority (PVTA) Bus and Paratransit Service

PVTA is the largest regional transit authority in the state. PVTA's service area begins at the Connecticut state line and stretches north to Deerfield, MA. PVTA has 42 scheduled or fixed bus routes and on-demand paratransit van service in 24 communities with a total population of 582,800 (2020 U.S. Census).

Funding for PVTA comes from several sources: federal, state and local governments; passenger fares; and advertising. The authority's operating budget in FY21 is \$47.1 million. Member cities and towns contribute an annual assessment to PVTA based on the level of service that operates in their community. Passenger fares cover about 8% of the total cost of the service. Funds for capital improvements are received through various state and federal grant programs.

MGL Chapter 161b prohibits PVTA from directly operating transit services so they contract with four private management companies:

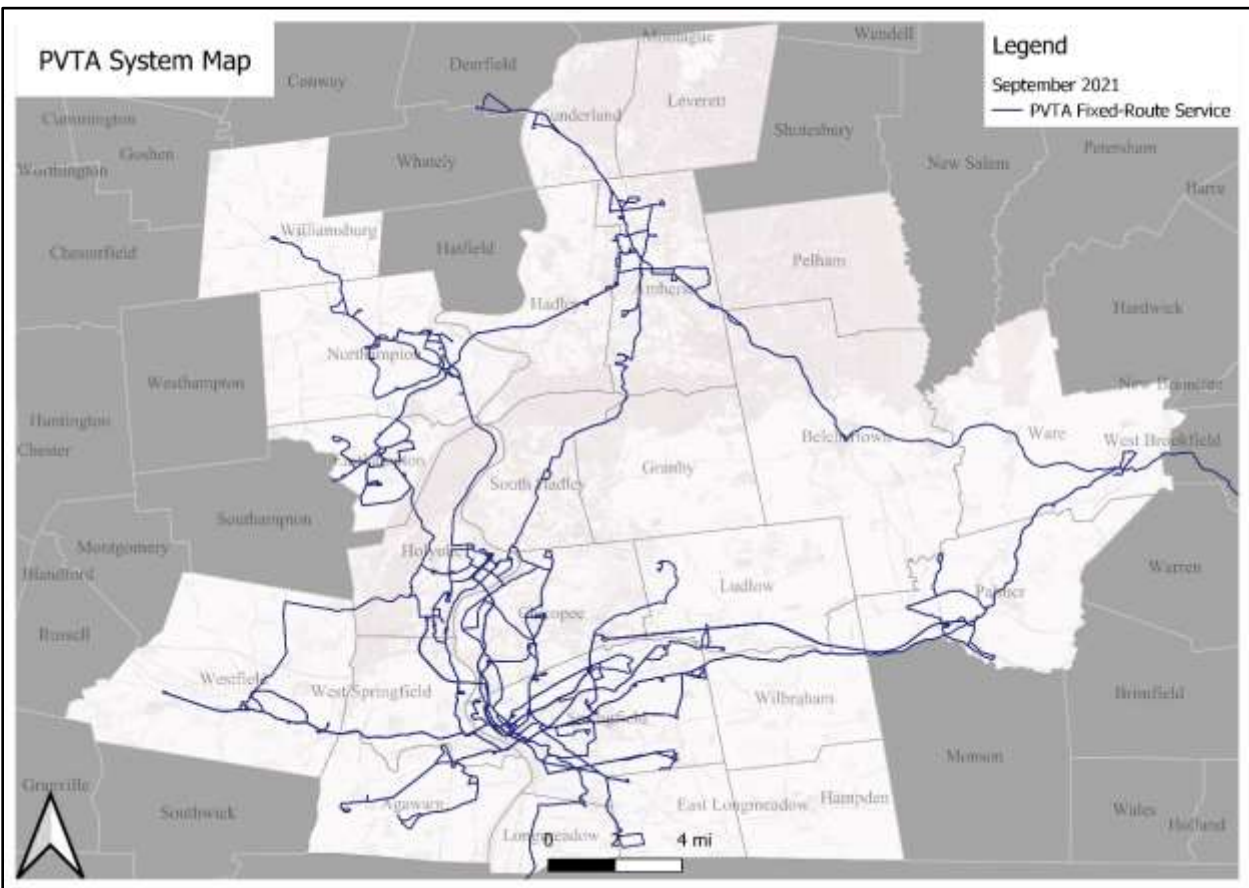
- **First Transit** operates fixed bus routes based in Springfield and Northampton
- **UMass Transit Services** operates fixed bus routes based at the University of Massachusetts serving the Amherst area.
- **Hulmes Transportation** operates community mini-bus shuttles in Easthampton, Palmer, and Ware
- **Quaboag CDC** operates an intercity fixed bus route between Amherst and Worcester
- **NEXT** operates all paratransit van services and a fixed bus route between Northampton and Hampshire College.

PVTA's basic fare is \$1.50 per ride. Transfers cost an extra 25 cents and are good for 90 minutes from time of purchase. Reduced fares of 75 cents per ride are offered for elderly and disabled customers, as well as Medicaid card holders (transfers are 10 cents). The fare for children aged 6 to 12 is 90 cents: children younger than age 6 ride free with an adult. Monthly unlimited

ride passes are \$54, with a discounted price of \$26 for elderly, disabled, and Medicaid card holders. PVTA also offers 1-day unlimited ride passes for \$3.50 and 7-day passes for \$15.

Fares for routes serving the University of Massachusetts are collected under a “proof of payment” system in cooperation with the University and other Five Colleges institutions (Smith, Mount Holyoke, Hampshire and Amherst Colleges). Instead of onboard collection, fares on these routes are collected through activity fees that are paid by students, as well as subsidies from the institutions. Students, faculty and staff of these institutions must be prepared to show their current school ID cards as proof of fare payment when riding the bus. Riders who are not affiliated with the 5 Colleges must purchase multi-ride passes or single ride tickets. Cash is not collected aboard UMass Transit buses in the Amherst area.

Figure A5-10 – PVTA Service Communities and Scheduled Bus Routes



The following cities and towns make up PVTA’s service area:

Agawam	Granby	Ludlow	Sunderland
Amherst	Hadley	Northampton	Ware
Belchertown	Hampden	Palmer	West Springfield
Chicopee	Holyoke	Pelham	Westfield
Easthampton	Leverett	South Hadley	Wilbraham
E. Longmeadow	Longmeadow	Springfield	Williamsburg

a) PVTA Bus Riders

A 2019/22 passenger survey found that 30% of PVTA’s “Southern System” (Springfield, Holyoke, Westfield) riders use the bus for work, while 23% of “Northern System” (Amherst, Northampton) riders do the same. The other specified trip purposes in the Southern System were shopping (21%), Medical (13%), Social (13%), College (9%), and School (8%); the other specified trip purposes in the Northern System were College (56%), Shopping (20%), Social (20%), Medical (5%), and School (2%). Incomes were reported differently in each survey: the 2019 Southern Survey found 53% of riders reported a household income below \$21,000 per year, while the 2022 Northern Survey found only 10% of riders reported a household income below 100% of the Federal Poverty Level (roughly \$20,000 for a household of two). 51% of riders reported “no license” or “can’t afford to drive” on the 2019 survey, while on the 2022 survey, 47% of riders reported “no car,” “no license,” or “can’t drive.” On the 2019 survey, passengers were asked if they had another way to make their trip, with 67% reporting “no,” however, the 2022 survey asked instead how passengers made trips when PVTA was not an option, and only 19% reported that they could not make those trips.

Table A5-8 – PVTA Bus Route Ridership

Fiscal Year	Passenger Trips	% Change
2008	9,677,076	2.49%
2009	9,896,940	2.22%
2010	9,745,869	-1.55%
2011	10,152,538	4.01%
2012	10,766,142	5.70%
2013	11,128,713	3.26%
2014	11,415,923	2.52%
2015	12,074,280	5.45%
2016	12,154,880	0.66%
2017	11,466,527	-5.66%
2018	10,902,207	-4.92%
2019	10,120,344	-7.17%
2020	8,131,759	-19.65%
2021	3,885,177	-52.22%
2022	6,077,602	56.43%

Fiscal year: July 1 through June 30 Source: PVTA

Ridership decreased dramatically in the 2020 and 2021 fiscal years as a result of the COVID 19 pandemic. An increase in ridership of over 50% occurred in 2022. This trend has continued in 2023.

b) PVTA Bus Fleet

PVTA’s bus fleet consists of 192 vehicles from three manufacturers: 63 Gillig low-floor clean diesel vehicles manufactured after 2006, 105 standard New Flyer diesel buses, 5 standard and 4 articulated New Flyer hybrid-electric buses, 8 New Flyer battery-electric buses, and 7 Proterra battery-electric buses. All buses provide comparable passenger amenities: all are air conditioned and equipped with wheelchair lifts or ramps. PVTA’s buses are based at three garages, as shown in Table 5-9.

Table A5-9 – PVTA Bus Fleet

Bus Model	Springfield Garage (Southern Area)	Northampton Garage (Northern Area)	UMass Garage (Northern Area)	Totals
Gillig	48	6	9	63
New Flyer	80	11	27	118
New Flyer (Articulated)	0	2	2	4
Proterra	7	0	0	7
Totals	135	19	38	192



Pictures of the PVTA Gillig low-floor bus, New Flyer standard and articulated buses, and the Proterra battery-electric bus

c) PVTA Paratransit Service

Paratransit is a demand-response door-to-door van service that is scheduled by the rider. PVTA’s fleet consists of 128 vans. These vans are equipped with wheelchair lifts and other special equipment to ensure the safety of disabled riders. As the average age of the region’s residents continues to rise, the need and demand for paratransit services will increase substantially. Paratransit fares typically cover only about 10% of the service cost.

This section describes the two types of paratransit van service that PVTA provides to residents of its 24 member communities. Total ridership for the service is presented below.

Table A5-10 – PVTA Annual Paratransit Ridership

Fiscal Year	Annual Rides	% Change
2008	308,787	3.00%
2009	308,369	-0.14%
2010	317,733	2.95%
2011	318,869	0.36%
2012	316,208	-0.84%
2013	312,015	-1.34%
2014	304,998	-2.30%
2015	310,133	1.66%
2016	333,830	7.10%
2017	297,627	-12.16%
2018	291,932	-1.91%
2019	260,582	-10.74%
2020	196,770	-24.49%
2021	109,556	-44.32%
2022	150,074	36.98%

Fiscal year July 1 through June 30 Source: PVTA

The ridership declines associated with the COVID-19 pandemic began late during FY20, in March. The first full year under pandemic conditions was FY21, as demonstrated by the nadir in ridership during that fiscal year. Ridership on all transit services made a partial recovery in FY22 but remains below pre-pandemic levels.

- **Americans with Disabilities Act (ADA) Service** -- Federal law requires that public transit providers offer paratransit service that is comparable to their fixed route bus service to disabled customers who are unable to use regular buses. Customers must be eligible to use the service, and an application and approval process is required. Trips must be scheduled at least one day in advance. ADA paratransit service is available only within three-quarters of a mile of a fixed bus route, and the trip must start and be completed during the same hours that the nearest regular bus route

operates. The fare is \$3.00, \$3.50, \$4.00, or \$5.00 per ride, depending on pickup and drop off locations.

- **Senior Dial-A-Ride Service --** PVTA also provides van service to people aged 60 and over in its 24 member communities. This service is operated on a space-available basis Monday through Saturday from 8:00 AM to 7:00 PM. Fares are \$3.00, \$3.50, \$4.00, or \$5.00 per ride, depending on the pickup and drop off locations. Tickets are available from local senior centers and the PVTA Information Center in \$0.50 or \$3.00 denominations and discounts are often available.

PVTA conducts quarterly Paratransit rider meetings. Meetings are held in both the southern and northern regions – usually within a day or two of each other. PVTA provides free rides to those who wish to attend these meetings. PVTA uses these meetings to pass on any new information to their Paratransit riders and to get feedback from them regarding any issues they may have with the service.

Councils on Aging (COAs) and Senior Centers in the PVTA service area also provide transportation to their senior residents. Below is a table showing the level and type of service provided by each COA.

Table A5-11 – PVTA Service Area Councils on Aging and Senior Centers

City or Town	Transportation Provided?	# of Vehicles	Hours of Service
Agawam	Yes	2 vans	varies, M-F
Amherst	Yes	No vans - volunteers	Varies
Belchertown	Yes	1 van	8:00 - 3:30 M-Th 8:00 - 1:00 F
Chicopee	Yes	2 cars, 2 vans	8:30-3:30
East Longmeadow	Yes	1 van	9:00 - 3:00
Easthampton	Yes	1 van, 2 shuttles - volunteers	8:00 - 4:00
Granby	Yes	2 vans	9:00 3:00
Hadley	Yes	1 van	Thursday only
Hampden	Yes	1 van	9:00 - 3:00
Holyoke	Yes	3 cars	8:15 - 3:30
Leverett	No		
Longmeadow	Yes	1 van	varies
Ludlow	Yes	2 vans	8:00 - 4:00
Northampton	Yes	1 van - volunteers	varies
Palmer	Yes	2 vans	8:00 - 3:30
Pelham	info not available		
South Hadley	Yes	1 van	9:00 - 3:00 in town
Springfield	No		
Sunderland	No		
Ware	Yes	1 van	9:00 - 12:00
West Springfield	Yes	1 van	8:00 - 4:30
Westfield	Yes	No vans - volunteers	varies
Wilbraham	Yes	1 van	varies
Williamsburg	Yes	No vans - volunteers	8:30-1:30 M-Th

2. Franklin Regional Transit Authority (FRTA) Paratransit Service

There are 14 additional towns in the PVPC region that are not members of PVRTA and instead contract with the Franklin Region Transit Authority (FRTA), based in Greenfield, for paratransit service. These towns are Blandford, Chester, Chesterfield, Cummington, Goshen, Huntington, Middlefield, Montgomery, Plainfield, Russell, Southampton, Southwick, Westhampton, and Worthington.

Because these communities are located in the furthest western and southern portions of the PVPC region, they are not within the $\frac{3}{4}$ mile buffer of any fixed route bus service in the region and therefore no ADA paratransit service is available. Senior dial-a-ride service is offered for persons aged 60 and older through municipal senior centers. In some cases, pre-certification of eligibility is required. Days, hours of operations, fares and service frequency vary by town. The FRTA paratransit fare varies by route. It is double the fare for the fixed route service.

3. Regional Coordinating Councils

Massachusetts enacted Executive Order 530 in 2011 to examine and offer suggestions to improve/reform Community, Social Service and Paratransit transportation. The Order established a Commission of 16 members charge with making recommendations to improve transportation services use by persons with disabilities, low incomes, limited English proficiency, and seniors and visitors to the Commonwealth. Recommendations stemmed from public hearings. The establishment of Regional Coordinating Councils on community transportation came out of this group as a recommendation. While each Regional Coordinating Council is different and reflects local priorities they generally seek to:

- Identify unmet service needs.
- Develop regional priorities.
- Coordinate existing services to serve more people at the local level.
- Report unmet needs to the appropriate government agency (i.e., MassDOT).
- Raise awareness of the important role community transportation services play for all.

As with Public Transit services, RCC coverage in the Pioneer Valley is represented by five separate Councils representing distinct needs throughout the wide Pioneer Valley geographic area.

Table A5-12 – Regional Coordinating Councils in the Pioneer Valley

RCC	Coverage Area	Contact	Meeting Schedule
Pioneer Valley	Agawam, Amherst, Chicopee, East Longmeadow, Easthampton, Granby, Hadley, Hampden, Hatfield, Holyoke, Longmeadow, Ludlow, Monson, Northampton, South Hadley, Springfield, West Springfield, Westfield, Wilbraham	Carmen Rosa, Stavros	Meeting dates and times vary
Hilltown	Becket, Blandford, Chester, Chesterfield, Cummington, Dalton, Florida, Goshen, Granville, Haydenville, Hinsdale, Huntington, Middlefield, Williamsburg	Kate Bavelock	Group still forming, meeting dates and times vary
Quaboag	Belchertown, Ware, Palmer, Monson	Gail Farnsworth French	Group is active, meets every two months
Central Mass	Brimfield, Holland and Wales	Constance Mellis	Group is active, although participation by Pioneer Valley communities is minimal

Source: Massachusetts Department of Transportation, Rail and Transit Division, <https://www.mass.gov/service-details/regional-coordinating-councils-for-community-transportation>, 2019.

a) Pioneer Valley Regional Coordinating Council

Pioneer Valley Regional Coordinating Council does not currently meet on a regular basis. This RCC was formed in 2012 and met regularly through February 2018.

b) Hilltowns Coordinating Council

The Hilltowns Coordinating Council collaborates with local Councils on Aging; the local area agency on aging, Highland Valley Eldercare; Independent living advocacy organization, Stavros; and Cooley Dickinson Health Care. While their focus is to help residents get to other locations through FRTA demand response vans and their own Hilltown Driver Pool, the Hilltowns Coordinating Council is also focused on economic development to revitalize rural downtown areas that will increase access to services, entertainment, and food.

The rural communities of Middlefield, Chester, Blandford, Huntington and Granville have fewer college or university graduates than communities like Northampton, Williamsburg, Amherst, Pelham, and Longmeadow. The Hilltown RCC and Hilltown CDC provide outreach to Councils on Aging throughout their area.

4. Commercial Scheduled Bus Service

The Pioneer Valley is served by two major commercial bus passenger carriers that provide scheduled service to destinations within the region, as well as cities and towns throughout New England and North America. These carriers serve three bus terminals and other stops in the region. Service offered by these carriers has decreased since the COVID pandemic but continues to improve. Commercial bus services find new competition with new regional train service provided by Amtrak, CT Rail from Springfield to New York, grant funded public transit routes, and access to Uber/Lyft options.

a) Bus Terminals and Service Locations

- **Springfield Union Station** Located at 55 Frank B Murray Street in downtown Springfield, this terminal is the regional hub for bus and rail service. The station is owned by Springfield Redevelopment Authority and managed by Appleton Corporation. It has 25 boarding gates, 17 of which are leased to PVTA while 8 are used by intercity buses (Peter Pan and Greyhound). There are waiting areas, a ticket counter and concession vendors for passengers, and a concourse connecting to Amtrak services on Lyman Street. The upper floors are used for office space. On an average day, over 2,600 PVTA customers board at Union Station.
- **Northampton Bus Terminal** – This three-story building at One Roundhouse Plaza behind City Hall accommodates two intercity buses and includes an enclosed waiting area (PVTA service is available one block west at the Academy of Music). Approximately 5 trips per day depart from this terminal. The building also contains commercial offices and a restaurant. The terminal was built in 1984 as a project of Peter Pan Bus Lines and the former Western Mass Bus Lines. Today, it is operated by Peter Pan and is also served by Greyhound.
- **Holyoke Transportation Center** – This transit hub is located at 206 Maple Street in downtown Holyoke. It replaced the old Veterans Park location. The center opened in September 2010 and has seven bus bays for PVTA vehicles. PVTA has 8 routes servicing the Holyoke Transportation Center. On an average weekday, over 850 passengers board at this terminal. It has an enclosed waiting area and a ticket and information desk. It is a joint project of PVTA., Peter Pan and the City of Holyoke. Community and education facilities are located on the upper floors.
- **Olver Transit Pavilion** – This transit hub is located at 10 Arnold Street in Westfield. The pavilion opened in April 2017 with four bus bays for PVTA vehicles, served by 3 PVTA routes. On an average weekday 160 passengers board at this terminal. It has an enclosed waiting area with vending machines and real-time departure information.
- **Other Commercial Bus Service Locations** – Service provided by Peter Pan (4 trips a day) is available from the University of Massachusetts and

Amherst Center via the Northampton Bus Terminal to Springfield Union Station. In addition, there are two direct trips on Friday afternoons to Boston South Station and another two return trips on Sunday evenings.

b) Commercial Carriers

The commercial bus passenger market in New England complements inner-city service offered by regional transit agencies. In the Pioneer Valley, two intercity carriers offer intercity service. Additionally, intercity service is supported through federal 5311(f) grant funding to PVTA.

- **Peter Pan Bus Lines** has served the region for more than 75 years. The company carries the most commercial passengers in the region, providing daily service to destinations within and outside the Pioneer Valley. The carrier has two primary routes offering service four times a day: Amherst to Boston (via Springfield and Worcester), UMass Amherst to Boston (via Worcester) and Springfield to New York City. Peter Pan also operates one trip a day to and from Albany, NY.
- **Greyhound Lines, Inc.**, based in Dallas, Texas, serves approximately 3,700 destinations in North America. Greyhound is owned by FlixBus North America, Inc. from Munich, Germany. Terminals in the Pioneer Valley include Northampton and Springfield. Greyhound operates East-West service from Albany through Springfield to Worcester and Boston in addition to North-South service along I-91.

c) Federally Supported Inter-City Service

In 2021, PVTA received Federal 5311(f) grant funding to provide supplemental inter-city service to connect the Pioneer Valley to Worcester and points East. Three trips per day are provided Tuesday – Saturday and two trips per day are provided on Sunday.

5. Shuttles, Charters and Taxis

There are a variety of transportation services in the region that are geared to help people make trips for tourism, recreation or other special purposes. These are summarized below.

a) Shuttles

Van shuttles serve an important segment of the region's transportation market by serving destinations for which demand may be relatively frequent; or involve passengers with special needs or schedule requirements. Commercial shuttle operators include Valley Transporter, which focuses on service to and from airports and rail stations in New England. Non-profit organizations also operate shuttles, typically for their clients. Examples include municipal councils on aging, day care providers and social service agencies.

The COVID Pandemic changed the transportation landscape throughout the Pioneer Valley. Shuttles are currently in flux. Like many local taxi shuttles, the original owners of the Valley Transporter stopped operations in March 2020. New owners (drivers for the company) reopened in January 2023¹⁸. Many of the taxi companies offer on-demand service to the local Airports and Train Stations.

b) Medical Trips

The local Federally Qualified Community Health Centers (Hilltown CHC, Caring Health Center and others) offer van transportation to medical appointments through grant funding. Some of which includes funding through the Connecticut River Valley Farm Worker Health Program. PVRTA also offers an on-demand paratransit complementary service as an FTA requirement.

c) Charters and Tours

Charter and tour bus services in the region provide special trips for tourism and other purposes within and outside the region. Commercial companies offer package trips and private party excursions to many attractions throughout the Pioneer Valley, including Yankee Candle Company in South Deerfield, Basketball Hall of Fame in Springfield, MGM Springfield as well as gambling casinos in Connecticut, Six Flags Amusement Park in Agawam, senior tours to Atlantic City, and other recreational trips. Major charter and tour providers in the region include Peter Pan Bus Lines, King Ward Coach Lines, Travel Kuz and Laidlaw, Inc.

d) Taxis

There are 31 taxi-based companies in the Pioneer Valley. It is unknown how many of those 31 are legally registered with the state or locally to operate. Many of these companies offer service to and from both Bradley International Airport in Connecticut and Logan International Airport in Boston. Taxis serve as a needed service within the Pioneer Valley due to gaps in fixed-route transit and Transportation Networking Companies (TNCs) and areas of low car ownership. In addition to providing a gap service between TNCs and Public Transit, Taxis offer transportation to the unbanked and underbanked. Current Census estimates place this population at 7% of the U.S. population. A traditional hub for taxi service is the use of taxi stands in many metropolitan

18

Morrison, H. (2022, March 2). Valley Transporter readies for spring break travelers, weddings as COVID pandemic restrictions eased. Retrieved February 10, 2023, from MassLive.com: <https://www.masslive.com/coronavirus/2022/03/valley-transporter-readies-for-spring-break-travelers-weddings-as-covid-pandemic-restrictions-eased.html>

communities. There are currently no registered taxi stands in Western Massachusetts.

e) Uber/Lyft

Uber (since 2015) and Lyft (since 2017) offer mobile device app-based ride hailing. Drivers are independent, non-unionized and often take on rides as a secondary source of income. While Springfield saw robust ridership before the COVID Pandemic in 2019 (460,682 rides between Springfield and PVTA communities), by the end of 2020 ridership fell below 45% of that level (or 205,935), and again to 37% of 2019 (or 171,604) in 2021. A map of rides between communities shows concentrations in Springfield, West Springfield, Holyoke, Chicopee and Amherst. Beyond these more populated areas there is a lack of markets. The TNC industry is subject to wide swings in market volatility, periodically forcing riders to seek alternate options or being stranded. Uber and Lyft are also the only options available to those with access to credit cards. Access includes the use of prepaid credit cards and mobile phone payment options. Hampden County has a smartphone adoption rate of just 84.5% while Hampshire County is 88.7% (2021 ACS 1-Year Estimates). This limits access to this mode of travel.

6. Carpooling and Vanpooling

The Pioneer Valley has a number of facilities, organizations and programs to help people share rides, either on public transportation or by private autos. Ride sharing is increasingly popular as more facilities and programs for it become available and the price of auto fuel fluctuates. There are several opportunities for ride sharing in the Pioneer Valley. These are summarized below.

- MassDEP regulates large commuting footprints. Initially that regulation included the MassDOT MassRides Program (which has ended). Agile Mile, Inc. (a former contractor of the MassRides Program) continues to offer carpool and vanpool matching services through Baystatecommute.com. Employers continue to offer incentives despite the change in regulation on a case-by-case basis.
- UMASS Commuter Options Program (COP) helps University of Massachusetts employees and students form carpools, use the bus, or find other ways to get to campus. The goal of the program is to reduce the number of private cars on campus; UMass has approximately 11,000 on campus parking spaces (not including metered spaces), but 12,000 to 15,000 vehicles come to campus each day. The service is free to employees and students and includes carpool matching, reduced parking fees, preferred parking spaces, free one-day passes, guaranteed rides home, and information on alternative commuter options. UMass has nearly 40,000 students, faculty and staff.

- Carpooling matching services in the area help people find fellow travelers who are traveling to similar destinations so they may share rides—either for regular daily commutes within the region, or for onetime long-distance trips. Many people use online bulletin boards, such as Craigslist, to find carpooling partners. Commute with Enterprise offers car and van rental programs for groups of commuters. Vehicles are either housed at a commuter’s residence or common location.
- Commercial car sharing provides a much-needed alternative for private vehicle ownership to people desiring to live car free either by choice or necessity. While rural public transit provides its users with mobility through the Pioneer Valley, it faces limitations in frequency and access to outlying areas. Nationwide, car-sharing companies are considering partnerships with local organizations and community centers to help meet the needs of the low-income population. In our region, car sharing has been established in partnerships with academic institutions to mainly serve their student population and reduce demand for parking on college campuses. The car sharing program in our region is offered by Zipcar, a Massachusetts based car rental company. Currently their local fleet includes 32 vehicles scattered about the Pioneer Valley with the majority located within the Five Colleges area in Hampshire County. Locations include:
 - WNE Campus (Springfield)
 - Springfield College Campus (Springfield)
 - South Hadley
 - Holyoke
 - Amherst Center - 2 (not including UMass)
 - UMass Campus (Amherst) - 4
 - Northampton - 4 (not including Smith College)
 - Smith College Campus (Northampton)

Zipcar vehicles are currently available in Amherst, Northampton, South Hadley, Holyoke, and Springfield. Depending on vehicle availability, members can rent by the hour or by the day. The Zipcar Company maintains a policy which gives its members access to any car available in their system at any location in the United States, Canada, and select cities around the world. Members can access the reservation system through a variety of ways including phone, internet, and text messaging.

Another option is Turo, a platform where residents offer their own vehicles at unused times for rental at times they like. Riders can log on to rent the vehicles for a price.

Figure A5-11 – TNC Activity Between PVTA Communities - 2019

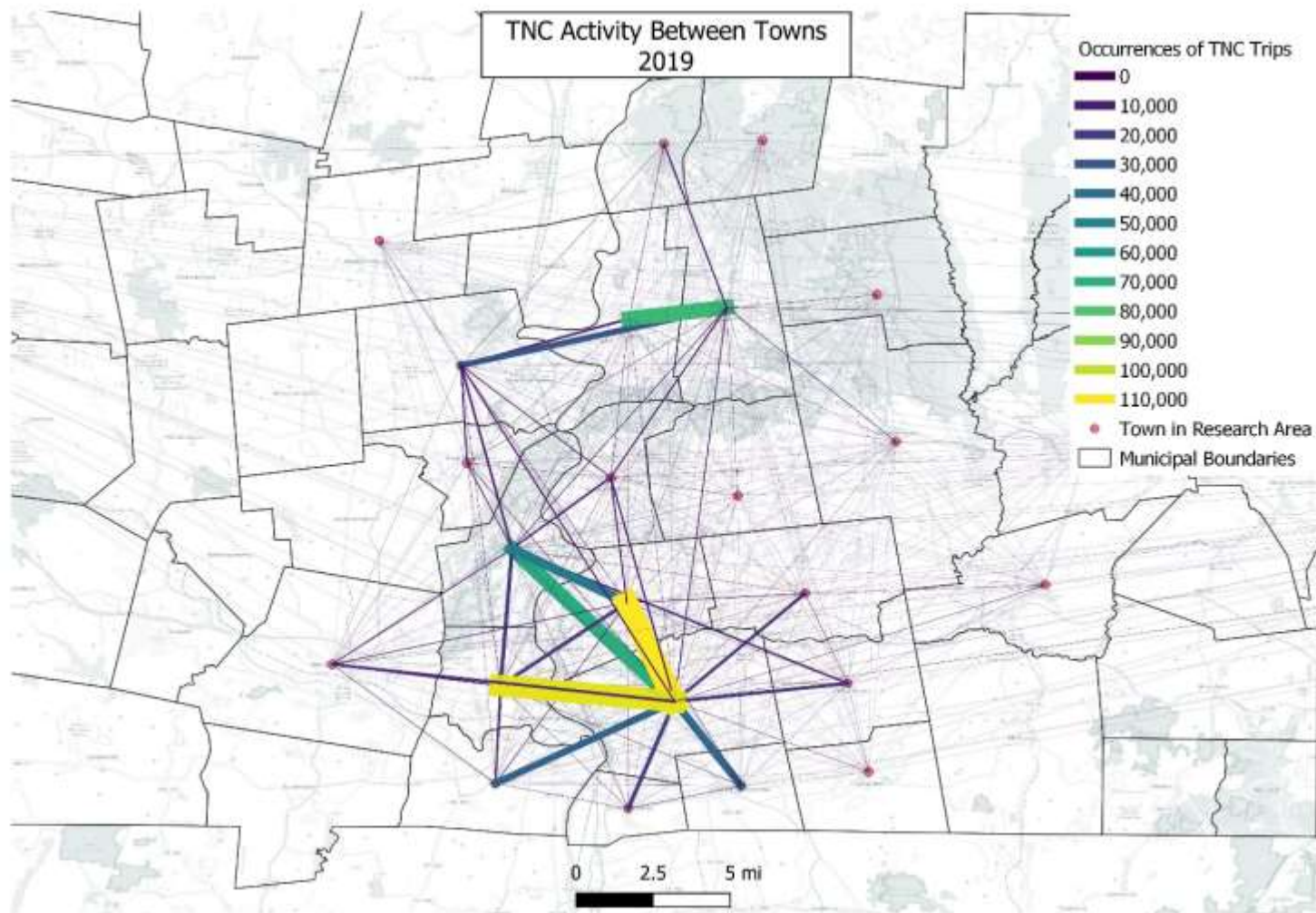


Figure A5-12 – TNC Activity Between PVTA Communities - 2020

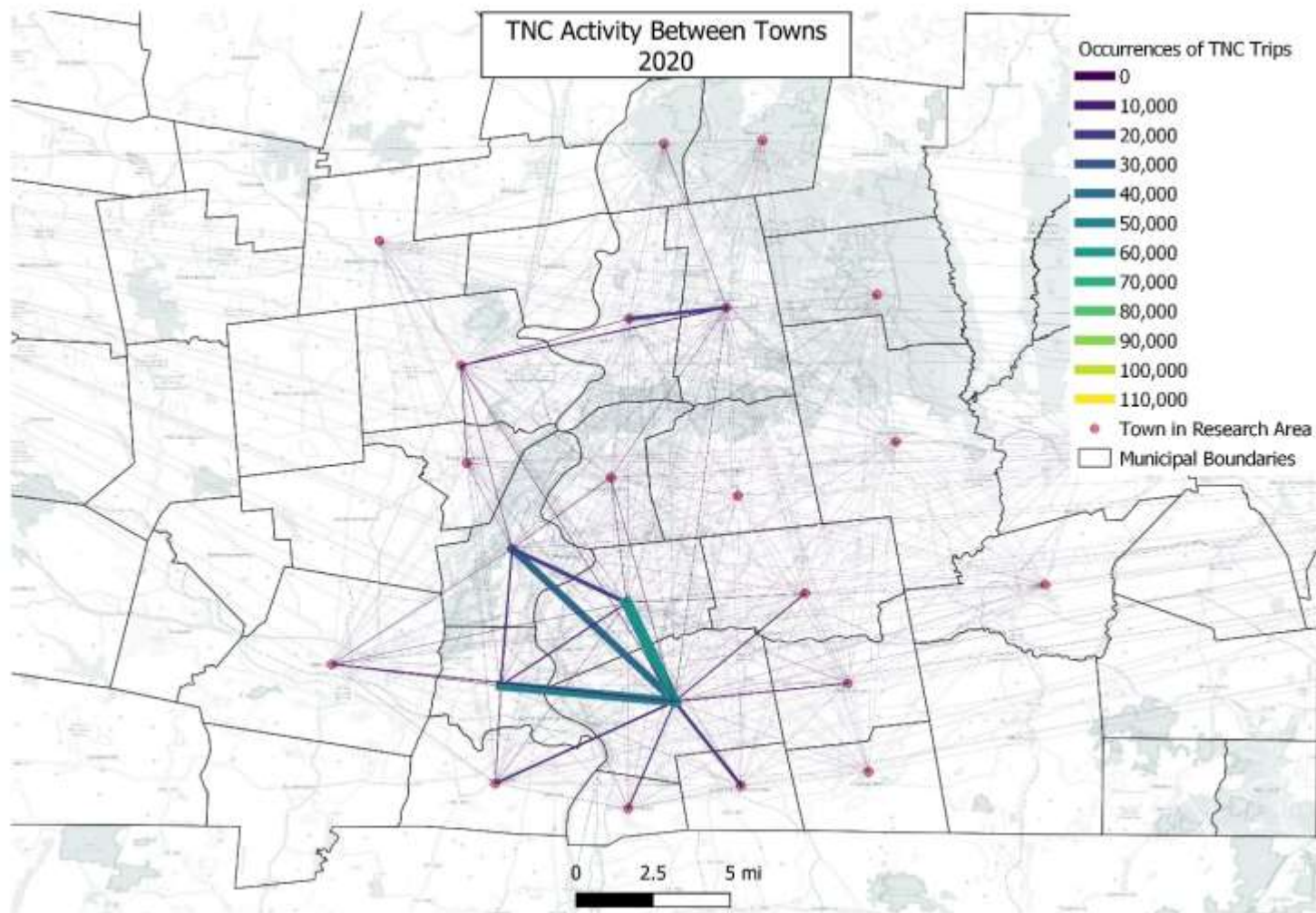
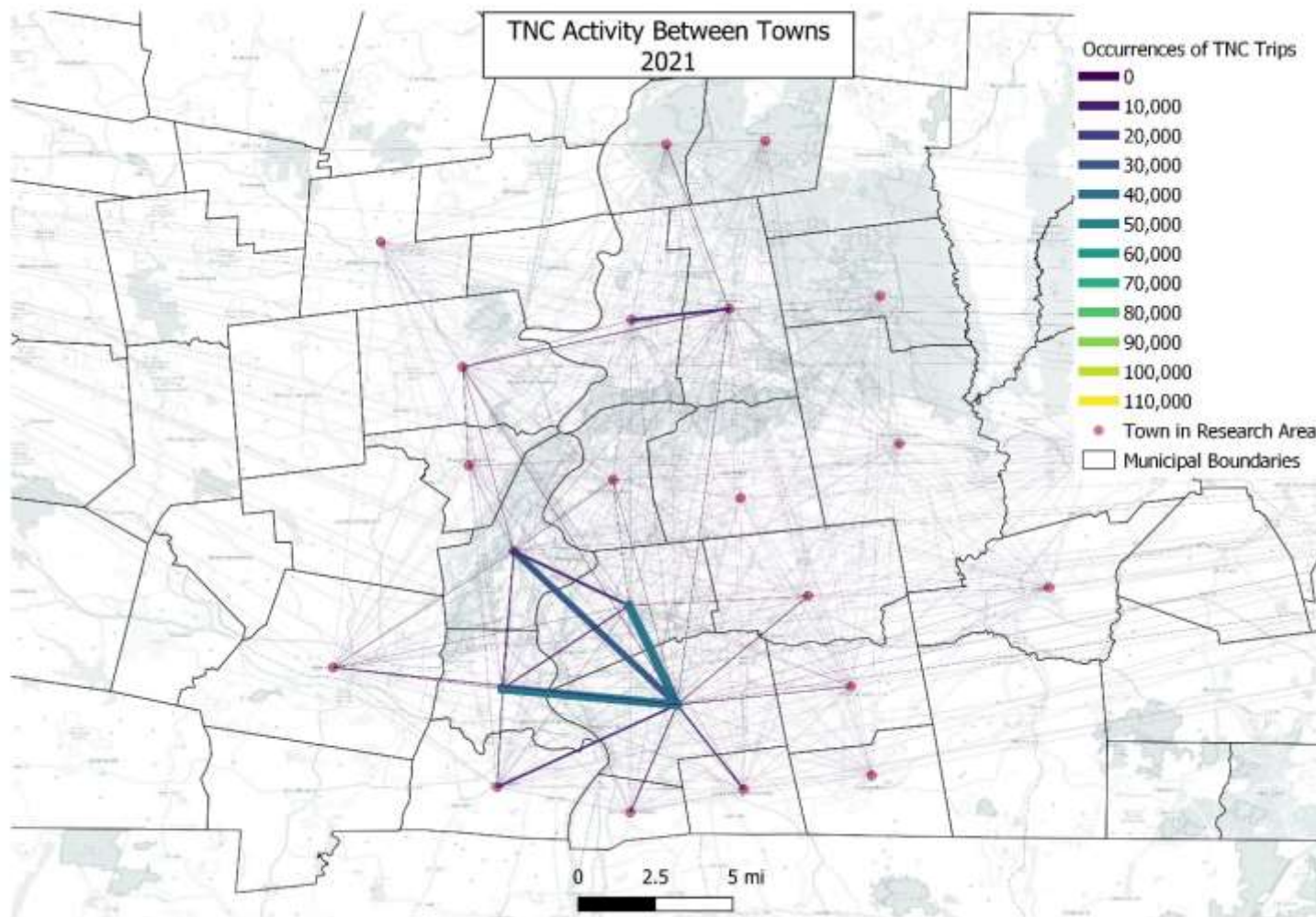


Figure A5-13 – TNC Activity Between PVTA Communities - 2021



7. Park and Ride

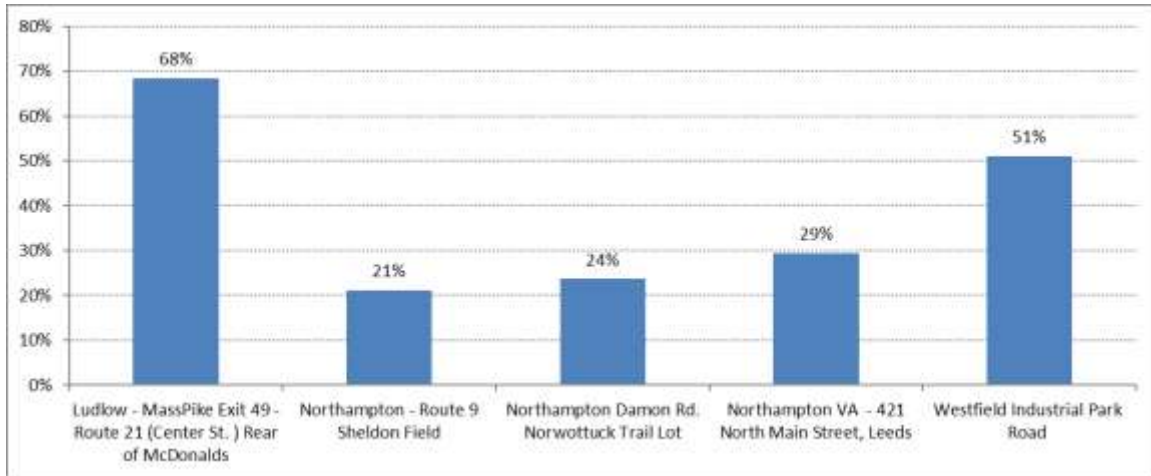
In the Pioneer Valley, there are several officially designated and “informal” park and ride lots. Those using these lots may be leaving their cars to board a PVTA bus for a local trip, catch a Peter Pan bus for an intercity trip, or join a carpool for a local or long-distance trip. These lots are described below.

- **Northampton Sheldon Field Lot**—Bridge Street at Day Street. Connection with PVTA service. Designated by the City of Northampton.
- **Northampton Norwottuck Rail Trail Lot**—Damon Road near Bridge Street (Route 9). Mainly used for carpooling; no convenient PVTA stop. Informal.
- **Northampton Veterans Administration Lot**—421 N. Main St. Leeds. Designated by the City of Northampton. Connection with PVTA service.
- **Springfield Trolley Park Lot**—Main Street at Boylston Street. Connection with PVTA service and within walking distance to Union Station. This lot is also near the intersection of I-91 and I-291, making it attractive for regional commuters who may not wish to drive in downtown Springfield. The lot is designated by City of Springfield but is currently closed and used as a construction staging area.
- **Ludlow MassPike Exit 54**—Center Street (Route 21) at Cherry Street near MassPike (I-90) Exit 54. Two lots near the rear and center areas of the McDonalds parking lot. Used principally for carpooling. Rear lot is formally designated; center lot is informal.
- **I-91 Exit 35**— Median area in Whately near South Deerfield Center. Connection with PVTA service. Formally designated but not counted by PVPC.
- **Westfield Industrial Park Road** – Close proximity to MassPike exit 41. Lot is used predominantly for carpooling and potentially by staff of the neighboring hotel. The lot is near PVTA service.

There are also numerous “informal” park and ride lots, often at shopping malls and commercial businesses near major highway access points.

A summary of average weekday park and ride usage at known lots is presented below.

Figure A5-14 – Park and Ride Lot Average Daily Occupancy 2010-2022



8. Passenger Rail

Passenger rail in and around the Pioneer Valley region has greatly expanded since the last update of the Regional Transportation Plan. Additional North/South intercity service between Greenfield and New Haven has been added and the existing CT Rail service between Springfield and New Haven has expanded. PVPC staff continue to explore opportunities to establish better passenger rail service between Springfield and Boston.

a) Southbound Services

Most trains in Springfield operate south to New Haven as either Amtrak or *CTRail* trains. There are 13 departures and 13 arrivals on weekdays on this route, of which 5 are *CTRail* services, 7 are Amtrak Regional services, and 1 is the Amtrak *Vermont* service. Amtrak provides daily through service on the *Vermont* between Springfield and Washington D.C., with major stops at Hartford, New York City and Philadelphia.

b) Northbound Services

The *Vermont* travels once a day in each direction between Washington D.C. and St. Albans Vermont. Northbound trains from Springfield stop at Holyoke, Northampton and Greenfield before continuing north to Vermont. MassDOT began operating additional intercity service in September of 2019 between Greenfield and New Haven. This Amtrak operated service is called the *Valley Flyer*. The line provides two early morning southbound trips and two evening northbound trips allowing Pioneer Valley residents to travel to New York city and back on the same day. The service was introduced on a trial basis as a pilot program, but in October of 2022, MassDOT committed to

permanently operating the route. Ridership has remained strong with the most travelled city pair being Northampton and New York city.

Table A5-13 – Annual Passenger Rail Ridership in the Pioneer Valley

Federal Fiscal Year		2017	2018	2019	2020	2021	2022
Northampton	NHT	19,974	21,939	22,939	10,942	8,202	27,006
Holyoke	HLK	1,487	1,582	1,718	774	630	2,359
Springfield	SPG	89,629	117,061	164,871	82,936	79,222	122,365
	Total	113,107	142,600	191,547	96,672	90,075	153,752

Source: MassDOT

Notes: Springfield ridership includes both CTRail and Amtrak ticketed passengers. 2018 & 2019 Springfield ridership includes CTRail estimates from CTDOT. 2022 ridership is preliminary

c) East - West Service

In addition to the Northeast Corridor service, there is also a long-distance train that serves the region. The *Lake Shore Limited* serves Springfield by providing daily service between Chicago and Boston. This continues to be the only passenger rail service available between Springfield and Boston. PVPC has been actively engaged in advocating for additional passenger rail service to Boston. PVPC participated in a MassDOT initiated study of East/West rail that recommended up to ten additional trips/day between Springfield and Boston. In addition, the Massachusetts State Legislature has established a Western Mass Passenger Rail Commission that includes the PVPC Executive Director. Recommendations from the Commission are expected later in 2023.

Amtrak has also been exploring opportunities for additional service on this route. The Amtrak 2035 Vision Plan prioritizes up to four additional trips/day between Boston and Albany. MassDOT is also awaiting announcement for the Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program. In December 2022, MassDOT submitted an application for funding to provide two round trips/day between Boston and Hartford. Grant awards are expected to be announced in late 2023.

d) Additional East - West Service

The Massachusetts State Senate earmarked funding to explore extending the existing MBTA service that currently terminates in Fitchburg/Lunenburg. The study is looking at the potential of providing service to Greenfield and as far west as North Adams. MassDOT has hired a consultant to complete this study that is still in the early stages of completion. Even though the project is outside the boundaries of the PVPC region, if constructed this project would provide additional passenger rail options to residents of the northern part of

our region. PVPC staff attend all MassDOT sponsored meetings to monitor progress on this study.

G. INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) utilizes technology in traffic control, communications, computer hardware and software to improve the performance of an existing transportation system. Through the dissemination of real-time travel information many benefits can be realized including increased safety, more efficient travel, and reduced congestion levels.

The Intelligent Transportation Systems (ITS) Strategic Deployment Plan for the Metropolitan Springfield and Pioneer Valley Region was completed in 1998. In March of 2005, the Commonwealth of Massachusetts developed a Regional Intelligent Transportation Systems Architecture for Western Massachusetts. This Regional ITS Architecture identifies the existing and planned ITS components in the region and how they will interface. An update to the regional architecture was completed in 2010. MassDOT completed a status report on the deployment of ITS equipment in April 2014. The regional architecture can be accessed here:

<https://www.consystem.com/mass/central/index.htm>.

1. ITS Infrastructure

MassDOT completed a project to design and deploy a communications infrastructure and Intelligent Transportation System (ITS) along the entire length of Interstate 91 and portions of Interstate 291 in 2011. Major components include 33 closed circuit television cameras (CCTV) and 17 Variable Message Signs. The project also included a fiber-optic communications network with additional capacity via 4 empty conduits.

More recently, MassDOT expanded their ITS infrastructure on major transportation corridors with a series of “Go Time” travel boards. There are currently 10 of these boards in the Pioneer Valley Region located along I-91 and I-90. The boards inform drivers of the distance and number of minutes it will likely take to travel from the message sign to their destination.

a) VMT Viewer

Vehicles Miles Travelled (VMT) values are estimated from MassDOT traffic count data included annually in the Highway Performance Monitoring System. This information is available for 2016 – 2021 (no 2018 data) and can be viewed by MassDOT District, MPO or at the City/Town level. This information can be viewed here: [VMT Data Viewer \(state.ma.us\)](#).

b) MassDOT 3 Year ITS Plan

Information received from MassDOT indicates a three-year plan for future ITS updates and improvements.

- Update the Regional ITS Architecture
- Develop a Transportation Systems Management and Operations (TSMO) Strategic Plan
- Develop a Public Facing GIS Layer
- Complete a New Asset Inventory
- Complete a New Life Cycle Analysis
- Hold New District Stakeholder Meetings
- Update the Potential Future Device GIS Layer
- Develop an ITS Strategic Plan

2. Pioneer Valley Transit Authority ITS Equipment

All PVTA vehicles are equipped with a mobile data terminal, global positioning system (GPS) locator, data radio and emergency alarm. Paratransit vans also have audible and visual navigation assistance. Significant features of PVTA vehicles as a result of ITS technology include:

- Automatic audio and visual stop announcements
- Automatic passenger counters
- Video and audio monitoring

PVTA provides real time information on each bus route through the following website: <http://bustracker.pvta.com/infopoint/>

3. 511

Access to 511 services for Massachusetts residents is available free of charge at: <https://mass511.com>. Mass511.com provides information regarding traffic incidents, road conditions, traffic cameras, active and planned construction and “Go Time” travel boards. The interactive map allows the user to select the information they wish to view and receive real-time updates to current conditions.

4. Smart Work Zone Management

MassDOT utilizes ITS devices to monitor, measure and evaluate traffic conditions to provide real-time information to the public and control operations within active work zones. The use of SWZ technology is determined on a project-by-project basis.

MassDOT currently has a research project on Smart Work Zone Control and Performance Evaluation Based on Trajectory Data. The proposed research aims to:

- Develop methods to extract vehicle trajectories.
- Use the trajectories to analyze driver behavior - particularly lane changes.
- Quantify the effects of various merging taper lengths and rumble strip configurations on vehicle speed and lane-changing behavior.
- Use the analysis results to identify safety hazards and opportunities to improve work zone safety and operations.

The estimated project completion date is August 2023.

5. EZDriveMA

EZDriveMA is MassDOT’s all electronic tolling system. The system opened on October 28, 2016, and is available in the Pioneer Valley region on the Massachusetts Turnpike. All tolls are assessed electronically at a series of gantries via an approved transponder or by “Pay by Plate” license plate recognition. For more information see: <https://www.ezdrivema.com/>. EZDriveMA is a member of the E-ZPass Program, and its transponders are recognized by toll agencies/companies in 19 states.

The EZDriveMA program consists of four toll payment methods:

- E-ZPass MA – A pre-paid transponder-based option with discounted tolls.
- E-ZPass – A pre-paid transponder issued from another state.
- Pay By Plate MA Registered – A license plate-based account option.
- Pay By Plate MA Invoice – A license plate-based invoice option.

H. BICYCLING AND WALKING

Bicycling and walking are inextricably linked to the quality of life in our communities. The Pioneer Valley region affords some of the best environments for walking and bicycling in the Commonwealth. An expanding network of off-road trails, and vibrant downtowns laced with sidewalks and scenic shared-use roadways create an unmatched potential. As a destination or as a place to call home, the Pioneer Valley offers a wide range of transportation choices. The focus of this plan is on the design and construction of projects and the implementation of programs that improve safety and encourage bicycling and walking for people of all ages and abilities.

Community interest and unprecedented support for walking and bicycling are reshaping many of our communities as summarized below:

- New federal and statewide initiatives including Safe Streets and Spaces, Complete Streets, Lines and Signs, Safe Streets and Roads for All, and the Safe Routes to School Infrastructure programs expand the focus on the critical roles of bicycling and walking.
- Calendar year 2023 marks the 24th year of [Bay State Bike Month](#) (previously Pioneer Valley Bike Month) in the Pioneer Valley.

- Currently, 79 schools in the Pioneer Valley activity participate in the Massachusetts “Safe Routes to School Program.”
- New infrastructure such as the [Springfield Brightwood/ North End neighborhood underpass](#) to the new Brightwood-Lincoln Elementary School on Plainfield Street enhances bicycle and pedestrian safety by eliminating at-grade crossing on roads with high traffic volumes and travel speeds.
- As of April 2019, 28 out of 43 communities in the region have participated in the Complete Streets Program and attended training through Baystate Roads.
- “An Act to Reduce Fatalities” was signed into law in Massachusetts in December 2022. This law requires motor vehicles to pass vulnerable users at a safe distance of not less than 4 feet and at a reasonable and proper speed. In May of 2023, MassDOT notified all cities and towns of an opportunity to request free regulatory signs to notify operators of motor vehicles of the requirements of the law that can be installed on roadways within their jurisdiction.

The most significant challenge for advancing regional goals for bicycling and walking is funding. While new funding opportunities exist in a revised Safe Routes to School infrastructure program, the MassTrails Program and Complete Streets Program, many communities struggle to find the resources to plan, design, implement and maintain shared-use paths, sidewalks, and bike lanes. The Massachusetts Healthy Design Directive and other state guidelines support bicycles and walking, and federal programs are recognizing the importance of “context-sensitive design” in transportation; infrastructure needs are growing while funding options leave communities struggling to keep up. Many of our communities have serious transportation funding gaps for their sidewalk network, are unable to make the necessary improvements to bridges, or struggle with local roads that have fallen into disrepair due to gaps in funding for maintenance. This infrastructure need is extremely challenging with inflationary cost pressures. Bicycling and walking are inherently dependent on short local trips and directly impacted by the lack of maintenance.

Several national trends are negatively influencing walking and bicycling in the Region. The reliance on personal handheld devices has expanded rapidly. In Massachusetts cell phone use creates more instances of distracted driving. Vehicle speeds increased during the Covid-19 pandemic contributing to a higher number of crashes that result in a fatality or serious injury.

Another trend has been the increase in the size and mass of personal vehicles. Larger/heavier vehicles are increasingly seen as contributing to bicycle and pedestrian fatalities. While the region’s population has grown modestly, a preference for large vehicles continues to grow.

Many communities in the region have very "walkable" downtown areas. The town centers of Holyoke, Springfield, Amherst, and Northampton have very high "walk scores" while more suburban neighborhoods and rural communities continue to struggle with obstacles and challenges for those desiring to bicycle or walk. The most challenging obstacle to walking and bicycling is often travel speeds. Travel speed on our streets continues to rise despite recent efforts in Massachusetts to allow municipalities to adopt speed zoning and [statutory speed limits](#). As of 2023 the communities of Springfield, Chicopee, Northampton, Ludlow, Plainfield, and Holyoke have adopted statutory speed limits.

To support the increasing number of people who walk and bike, the Pioneer Valley Metropolitan Planning Organization (MPO) has adopted this update to the RTP that includes policy-related actions and physical projects that local, state, federal and regional partners can collaborate on to improve conditions for pedestrians and bicyclists. The plan includes recommendations for bicycle and pedestrian features in the design and reconstruction of roadway projects, sets goals for bicycle and pedestrian safety, and promotes bicycling and walking through "Complete Street" initiatives.

The Pioneer Valley MPO formally adopted a [Vision Zero](#) policy in 2023. Vision Zero provides a framework for how the MPO will work to make regional roadways safer for all people. The RTP includes specific safety strategies that can aid in achieving a Vision Zero regional transportation network in the Pioneer Valley.

The Pioneer Valley land use plan "Valley Vision" includes zoning and community development tools to foster environments that support bicycling and walking. Valley Vision lays out a detailed strategy to promote bicycling and walking through compact, mixed-use growth in and around urban, town, and village centers.

1. Complete Streets

In 2016 MassDOT launched the Complete Street Funding Program to incentivize municipal best practices in Complete Streets policy and implementation. As of 2023, twenty-eight communities in the region have participated in MassDOT-sponsored Complete Streets training and 12 communities have funded projects in the Complete Streets Program. These projects and adopted policies have made local streets safer, while improving the health of Pioneer Valley residents through improved opportunities to stay active, reducing chronic disease. As of 2023, 18 communities: Hampden, Williamsburg, Amherst, South Hadley, Holyoke, Palmer, Goshen, Easthampton, Northampton, Holyoke, West Springfield, Agawam, Springfield,

Longmeadow, and Granville have adopted Complete Streets Policies. Locally, many Pioneer Valley communities have followed MassDOT's lead by incorporating "Complete Streets" concepts into the planning and design of local road projects.

In 2023 [An Act to Reduce Traffic Fatalities](#) was signed into law. This critical traffic safety bill supports the safety of "vulnerable road users." The law defines "vulnerable road users" to include people walking and biking; roadside workers; people using wheelchairs, scooters, skateboards, roller skates, construction workers on their job sites, tow truck drivers and first responders stopped on the side of the road. The "vulnerable road user" definition is crucial to future roadway safety efforts.

The law requires "safe passing distance" to be 4 feet, bringing Massachusetts in-line with most other states in terms of roadway safety. The law also clarifies the process for municipalities to alter speed limits in thickly settled areas from 30 mph to 25 mph both on state-controlled roads and on the roads they control. This is an update on the previously implemented [Chapter 90, Section 18](#). Slower speeds save lives, and this change will align with MassDOT's [new safe speeds philosophy](#). Under the law, state-contracted trucks must be equipped with safety side-guards, mirrors, and backup cameras to reduce fatalities of people walking and biking. The legislation improves data collection surrounding vulnerable road user crashes and standardizing analysis used to report crashes and incidents involving a person biking or walking. As part of this legislation, bicyclists are required to have both a front light and rear red light when riding at night.

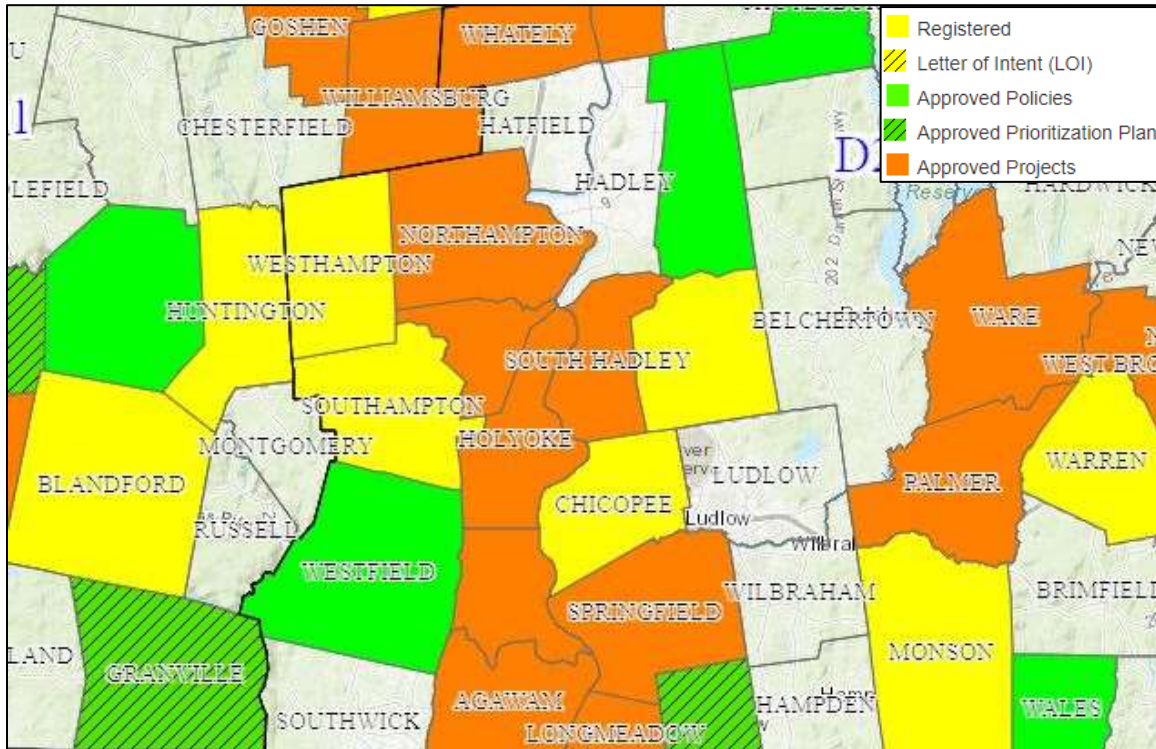
Streets are a vital part of livable, attractive communities. Regardless of age, ability, income, race, or ethnicity, everyone is served by safe, comfortable, and convenient access to community destinations and public places—whether walking, driving, bicycling, or taking public transportation. Complete Streets integrates people and place in the planning, design, construction, operation, and maintenance of our transportation networks.

In 2015, MassDOT adopted the "Separated Bike Lane Planning & Design Guide" and in the summer of 2021 (then) Lt. Gov. Karyn Polito cut the ribbon on the Morgan-Sullivan bridge between West Springfield and Agawam, marking the first MassDOT bridge project to include separated bicycle facilities.

The Commonwealth instituted a comprehensive shift in policy in 2016 with the adoption of the "Design Guide" that has become a national model for developing better road and bridge projects through a "Complete Streets" approach that balances the need for access and mobility through context

sensitive design solutions. The manual “ensures that the safety and mobility of all users of the transportation system (pedestrians, bicyclists and drivers) are considered equally through all phases of a project so that even the most vulnerable (e.g., children and the elderly) can feel and be safe within the public right of way.”

Figure A5-15 – Municipal Status of Complete Streets in the Pioneer Valley



2. Bicycle Facilities and Initiatives

Currently, seventeen communities provide over 90 miles of bicycle lanes, multi-use paths, or “rail trails” in the region, while several communities have similar projects in the design phase.

The Pioneer Valley has much to offer for bicycling including bike lanes, shared-use paths, side paths, striped shoulders, wide curb lanes, bike racks on transit vehicles, bike lockers, bike parking racks, employer-sponsored shower facilities, bike repair shops, maps, online rider resources, community bike share programs, bike rentals, organized rides, and sponsored races. Not far from the region’s urban core, the rural roads of Western Massachusetts offer a vast array of quiet scenic New England country roads that can be explored for days on end. At the same time, our communities face challenges in meeting public expectations in expanding and connecting the Region’s

bikeway network. Many of the off-road and on-road facilities are disconnected and are hampered by pinch points that include bridges.

a) On-road Infrastructure

Massachusetts law requires access for bicyclists and pedestrians on all roadways except limited access or express state highways. Currently, there are 45 miles of designated on-road bicycle facilities. These include bike lanes and designated bike lanes and bike routes in Agawam, Amherst, Brimfield, Chicopee, Granby, Holland, Holyoke, Monson, Northampton, South Hadley, Springfield, and Wales. Many more of these bicycle design treatments are in the planning stages as communities work to implement “complete street” approaches to design.

A major concern for pedestrians and bicyclists is the many bridges in the region. While most new or reconstructed bridge projects have followed state and federal guidelines for improving pedestrian and bicycle access, many bridges still lack sidewalks, and adequate shoulder width. The design and maintenance of these bridges directly influence the ability of people to walk or bicycle.

b) Bicycle Parking Improvements

The PVPC has worked with local communities to upgrade and expand existing opportunities for bicycle parking. PVPC has worked with local communities to install parking for more than 700 bicycles. Parking racks have included “U” style racks, ribbon racks, “rib” racks and bicycle lockers. PVPC purchased bicycle racks for several “Save Routes to School” partner schools in Springfield. PVTA initiated a bike rack purchase program to locate bike racks at high-frequency bus stop locations. PVPC also coordinated the purchase of bike lockers for use at park-and-ride facilities.

To assist in the installation of bike racks PVPC created a series of training videos. These and other videos are available on the PVPC YouTube page: <https://www.youtube.com/watch?v=um6oagL7bfk>

c) Bike Share Programs

The 2022 calendar year was the fifth year of operation of ValleyBike, the regional bikeshare system in 8 PVPC communities, providing a total of 75 stations. During its first two years, operations were halted during the winter and the system operated from April - November. During the 2020 calendar year, ValleyBike did not start until June because of the Covid-19 pandemic. The City of Springfield chose not to participate during the entire calendar year of 2020, ValleyBike service resumed in the City of Springfield in May 2021. Utilization data shows increases in the use of ValleyBike in both 2021 and 2022.

Table A5-14 – ValleyBike Total Rides

	2018	2019	2020	2021	2022
January				1,019	1,969
February				371	3,429
March				3,768	5,530
April		5,397		6,520	11,155
May		7,632		10,677	12,421
June	134	14,738	1,263	11,252	11,804
July	3,732	12,309	6,736	11,488	14,465
August	10,089	11,974	7,629	14,947	12,956
September	14,959	12,291	7,382	18,607	17,626
October	5,743	8,895	5,340	14,041	15,548
November	2,183	4,047	2,842	8,012	30
December			1,223	4,262	
Total	36,840	77,283	32,415	104,964	106,933

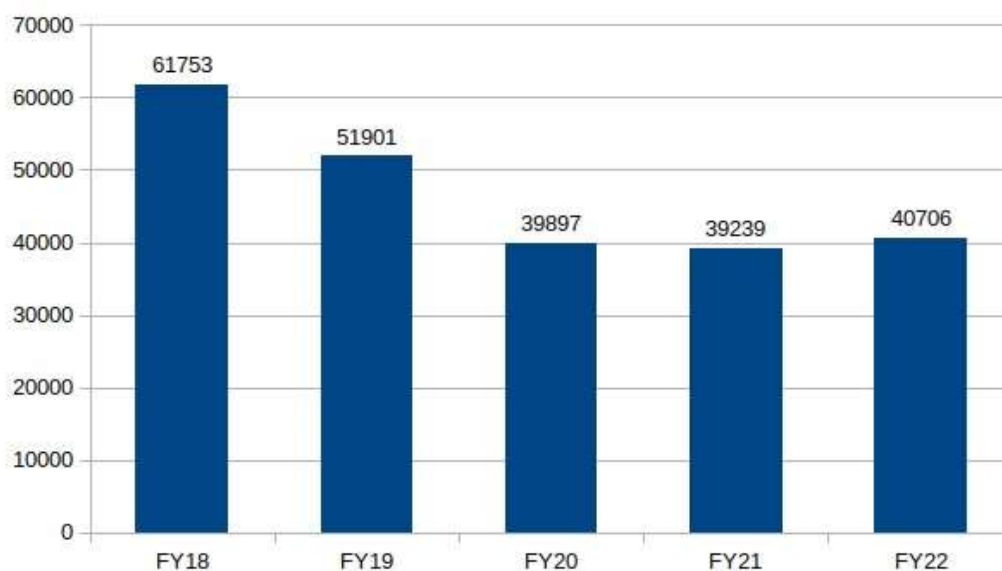
d) Bicycle Accommodations on Transit

The Pioneer Valley Transit Authority supports a popular “Rack and Roll” bikes-on-buses program for the entire region. All fixed route buses in the PVTA fleet are equipped with racks, allowing cyclists to transport their bikes on public service transit lines throughout much of Hampden and Hampshire County. In FY 2022 the PVTA bike racks were used 40,706 times (excluding UMass shuttle trips).



Installation of a bicycle on a PVTA bus

Figure A5-16 – PVTA Bikes on Bus Usage



The Pioneer Valley Transit Authority’s bikes on bus program “Rack and Roll” has dramatically improved access for bicyclists to transit and given thousands of people another choice in their mode of travel. Increased marketing and promotion for the service included an instructional video to acclimate new users. The video is available online in English and in Spanish at:

<https://www.youtube.com/watch?v=pNcW-ZaoEfg>.

e) Off-road Infrastructure (Shared Used and Multi-use Trails/Paths)

Off-road facilities include shared-use paths, sidepaths, rail-with-trail, traditional bikepaths, and rail trails are popular in the region for several reasons. These facilities allow new users to be introduced to the benefits of walking and bicycling while isolating them from potential conflicts with motorized traffic. These facilities provide economic benefits through bicycle tourism and downtown retail and restaurants through foot traffic while reducing dependence on motor vehicle parking. Our strongest downtown business districts are in census block groups with the highest levels of walking and bicycling.

The Norwottuck Branch of the MassCentral Rail Trail is one example of the region’s commitment to bicycling and walking. The ten-mile Norwottuck Trail links the communities of Northampton, Hadley, Amherst, and Belchertown, and facilitates travel to and from educational institutions, downtown commercial areas, major employment centers, and residential neighborhoods. The Massachusetts Department of Conservation and Recreation (DCR) and MassDOT reconstructed the original 1992 “Norwottuck Rail Trail” (now part of

the MassCentral Rail Trail) in June 2015. The reconstructed path is wider in most places and incorporates several accessibility and intersection improvements including new bridge decks. Traffic counts on the Norwottuck Branch of the MassCentral Rail Trail reached a peak of 1,900/day in May of 2023. (Note: Additional volume counts for regionally significant bicycle facilities are uploaded and available at the [MassDOT Bike/ped Count Dashboard](#)).

In 2022 Chicopee's new Connecticut Riverwalk & Bikeway was opened to the public. The city-owned shared-use path along the Connecticut River flood control levee extends from the Medina Street boat ramp to Nash Field, a distance of 2.4 miles. This multi-use trail is composed of two parallel paths, a paved path for bikes located at the base of the dike and a gravel path located on top of the dike. The project includes overlooks to the river, way-finding signs, parking locations, pathways over the levee to connect neighborhoods to the trails, root barriers, fishing access areas, benches at scenic vistas, and bike racks.

In 2019 the Town of West Springfield opened the newest section of the Connecticut Riverwalk system addressing a need for visual access to the river while providing improved access to canoe launch areas.

In 2018 construction was completed on a MassDOT tunnel project by Northern Construction Services. The \$4.4 million tunnel under the active north-south Amtrak rail corridor provides a significant connection between the MassCentral Rail Trail and the New Haven and Northampton Canal Greenway and the Manhan Rail Trail.

The popularity of shared-use paths in the Pioneer Valley has brought new challenges and opportunities to those that use and manage these facilities. Interest in year-round use has pushed many communities to explore options for snow removal, and while recreation use still dominates trail activity many residents increasingly use the facilities for non-recreational trips. In 2019 PVPC completed a [study of at-grade crossing on shared-use paths](#) to better understand the safety challenges that these unique intersections present. Many of the recommendations of the study have been put into place.

For a detailed map of the existing and proposed regional bikeway network, please visit:

<https://pvpc.maps.arcgis.com/apps/webappviewer/index.html?id=8643f065eb6b408388c8a7da0f46189b>

Table A5-15 – Existing On / Off-road Bicycle Infrastructure

Pioneer Valley Bicycle Facility	Communities	on/off road	Length (miles)	Date Opened
CT. River Riverwalk and Bikeway	Agawam	off	1.50	9/17/04
Amherst Bike Route	Amherst	on	1.00	
Amherst Bikeway (Route 116)	Amherst	off	3.50	
Five College Bikeway	Amherst	on	6.00	
South Pleasant St. Bike Lanes	Amherst	on	0.25	7/15/01
UMass Connector Bikeway	Amherst	off	1.90	5/15/03
Norwottuck Belchertown Extension	Amherst/Belchertown	off	1.20	5/12/00
Chicopee Center Canal Walk	Chicopee	off	0.20	5/21/10
Redstone Rail Trail	East Longmeadow	off	1.57	9/9/10
Manhan Rail Trail	Easthampton	off	4.20	6/19/04
Dwight Street Bike Lanes	Holyoke	on	0.50	6/12/05
Hampden Street Bike Lanes	Holyoke	on	0.60	5/13/04
Route 5 Bike Lanes	Holyoke	on	1.20	7/8/06
Holyoke Canalwalk	Holyoke	off	0.30	6/25/10
Route 5 Bike Route	Holyoke/Northampton	on	8.00	6/25/86
Springfield (Ludlow) Reservoir Trail	Ludlow	off	3.10	
MBW Trail	Monson, Brimfield, Wales	on	17.00	6/10/98
Elm Street Bike Lanes	Northampton	on	0.80	6/15/00
New Haven and Northampton Canal Rail Trail	Northampton	off	2.10	7/1/05
MassCentral Rail Trail	Northampton	off	2.50	6/6/84
Rocky Hill Trail	Northampton	off	0.50	
Norwottuck Damon Road to Woodmont	Northampton	off	0.80	5/1/08
Norwottuck Look Park Extension to Grove St	Northampton	off	2.00	7/1/05
South Street Bike Lanes	Northampton	on	1.10	9/10/03
Northampton Canal/MassCentral Rail Trail	Northampton	off	1.00	9/26/89
Norwottuck Rail Trail	Northampton/Hadley/Amherst	off	8.50	5/15/93
Southwick Rails to Trails Phase I	Southwick	off	3.14	5/3/10
CT. River Riverwalk and Bikeway	Springfield	off	3.70	7/18/03
Westfield Riverwalk	Westfield	off	2.00	4/16/98
116 Five College Bike Lane Extension	Granby/South Hadley	on	.25	4/25/15
Columbia Greenway (segment 2, 3)	Westfield	off		
Tunnel MassCentral Manhan Rail Trail	Northampton	off	.10	2018
CT. River Riverwalk and Bikeway	West Springfield	off		2019
Ludlow Mills Riverwalk	Ludlow	off		
Agawam Connector Loop Bikeway	Agawam	on/off		
East Hadley Road Sidepath	Amherst	off		2019
Morgan-Sullivan Bridge	Agawam/West Springfield	off	.10	2021
Route 116 Sidepath	Amherst	off		
CT Riverwalk and Bikeway	Chicopee	off	2.44	6/2022
Ware Accessible Trail (MassCentral)	Ware	off		2022
Western Avenue Bikeway	Westfield	off		2021
Brightwood/ North End Underpass	Springfield	off	.1	2021
Grand Trunk Titanic Trail	Brimfield	off		
Total Mileage			83.15	

Table A5-16 – Proposed Bikepaths for the PVPC Region

Pioneer Valley Bicycle Facility	Communities	on/off road
North Campus Bikeway Extension	Amherst	on/off
Amherst Bike Route	Amherst	on
Five College Bikeway (including Notch)	Amherst, Granby, South Hadley	on/off
Brimfield Trail Expansion	Brimfield	on/off
CT. River Riverwalk and Bikeway	Chicopee	off
Redstone Rail Trail Extension	East Longmeadow	off
Route 47 Scenic Farm Bikeway	Hadley, South Hadley	on
CT River Greenway (Damon Rd. to Elm	Hatfield/Northampton	off
Appleton Street Bikeway Improvements	Holyoke	on
Holyoke Canalwalk (segments 2 and 3)	Holyoke	off
Holyoke Canalwalk Route 5 extension	Holyoke/Northampton	on/off
Elm Street Bikeway Extension	Northampton	on/off
Manhan Route 10 Spur to Burts Pit Rd	Northampton	off
Village Hill to Northampton High School	Northampton	off
Damon Road bicycle lanes and sidewalks	Northampton	on
Southampton Greenway	Southampton	off
McKnight Community Trail	Springfield	off
CT. River Riverwalk and Bikeway extension	West Springfield	off
MassCentral Rail Trail	Belchertown, Palmer, Ware	off
Columbia Greenway (segment X)	Westfield	off

f) Bicycle Signage Projects

The Pioneer Valley Planning Commission in collaboration with the City of Springfield, and other Live Well Springfield partners installed new map signs on the Connecticut Riverwalk and Bikeway in Springfield. In partnership with WalkBoston (now WalkMassachusetts) and with funding through Mass-in-Motion, 151 pedestrian wayfinding signs with distance markers were installed in Springfield, Belchertown, and Northampton. PVPC has worked with MassDOT and local partners to install bike route signs along Route 5 in Holyoke, “share the road” signs on many popular cycling routes, directional signs in Northampton, and signs on the Connecticut Riverwalk and Bikeway. PVPC also partnered with MassDOT and DCR on the installation of “Bay State Greenway” signs on the Manhan Rail Trail, the Southwick Rail Trail, Norwottuck Rail Trail and sections of Route 9 in Williamsburg.

g) Pioneer Valley Share the Road Program

The Pioneer Valley Planning Commission in collaboration with the Franklin Regional Council of Governments (FRCOG) produced a series of public service announcements and an informational video on bicycling and bicycle

safety entitled “Enjoy the Ride: Share the Road in the Connecticut River Valley.” The effort was part of a promotional campaign to encourage bicycling instead of driving. The videos were aired annually on local cable access channels during Bay State Bike Week and can be viewed here:

https://youtu.be/b_0aJ61T8Ug

<https://www.youtube.com/watch?v=3Eiye4XHm8&feature=youtu.be>

h) Massachusetts Bicycle Plan

The Massachusetts Bicycle Plan was updated by MassDOT in 2019. The Massachusetts Bicycle and Pedestrian Advisory Board in coordination with MassDOT began the process of revising and updating both the Bicycle Plan and the Pedestrian Plan. The plan prioritizes on- and off-road bicycling improvements and identifies a statewide bicycling network. The network improves multi-modal transportation generally and bicycle transportation specifically, as well as recreation, tourism, and economic vitality. Priority corridor such as the MassCentral and New Haven Northampton Canal Line Greenway are The Bay State Greenway are identified in the plan.

3. Pedestrian Circulation

Pedestrian access and circulation are typically better in town or city centers due to the physical design of such places. Shops, offices, restaurants, and other amenities are generally clustered together and connected by a pedestrian network which is often more accessible and efficient than the vehicle network. The central business districts of Amherst, Northampton and Springfield offer good examples of downtowns sensitive to pedestrian circulation and access. Sidewalks and walkways are extensive; crosswalks are signalized and access points for persons with disabilities are incorporated.

Sidewalks are the most common infrastructure feature devoted to pedestrian circulation. Whether or not sidewalks are provided in a community can influence the area's overall character and function. In addition to the sidewalks themselves, crosswalks and points of access for persons with disabilities can influence the degree to which these pedestrian networks facilitate circulation. The provision of sidewalks in the region varies with respect to location, quality and function. Many communities in the Pioneer Valley have realized the benefit of encouraging walking through infrastructure improvements. The Town of Ludlow constructed sidewalks within a mile of every elementary school. With children walking to school the town revamped its crossing guard program and saved money on busing. With local funding sources in short supply, many communities have had to “get smart” when it comes to pedestrian improvements. To lower costs, East Longmeadow developed a prioritized sidewalk infrastructure improvement plan and began

incorporating the cost of sidewalk improvements into larger roadway reconstruction projects. In the Forest Park neighborhood of Springfield, public works officials replaced painted crosswalks with new long wearing thermoplastic designs. While more expensive initially, the new crosswalks will last 5 times as long as painted crosswalks.

a) Safe Routes to School

The Massachusetts Safe Routes to School program promotes healthy alternatives for children and parents in their travel to and from school. The program aims to reduce congestion, air pollution, and traffic conflicts near participating schools, while improving health and mobility of school-aged children population. Safe Routes to School is a national movement to create safe, convenient, and fun opportunities for children to bicycle and walk to and from schools. The program's goal is to reverse the decline in children walking or biking to school. Nationally, only 15 percent of schoolchildren walk or bike to school compared to 50 percent in the 1950's. Most parents prefer to drop their children off at school using their personal automobile. The result is often increased congestion and higher vehicle emissions around the schools.

A total of 109 schools in the Pioneer Valley actively participate in the Massachusetts "Safe Routes to School Programs promoting healthy alternatives for children and parents in their travel to and from school. The program educates students, parents, and community members on the value of walking and bicycling and provides funding for sidewalks, crosswalks, and traffic calming measures. Funding for construction projects is also available through the [Safe Routes to School Infrastructure Program](#). The Roberta G. Doering Middle School and Robinson Park Elementary School are currently implementing infrastructure projects in Agawam. In Springfield, the Rebecca M. Johnson Visual and Performing Arts Elementary School is participating in the Safe Route to School infrastructure program. Past participation includes the William E. Norris School in Southampton, Jackson Street School in Northampton, Blueberry Hill School in Longmeadow, and Bridge Street School in Northampton.

PVPC purchased bike racks through a Live Well Springfield Community Transformation Grant to support the "The Safe Routes to School Program" in Springfield. The Springfield Safe Routes to School program is coordinated by the Springfield Safe Routes to School Alliance and is supported by the Springfield Housing Authority, the Talk/Read/Succeed program, Baystate Health Safe Kids program and Brightwood Health Center, the state Department of Public Health, Springfield Health and Human Services, Mass in Motion, Partners for a Healthier Community, the YMCA of Greater Springfield, and other groups.

Statewide the Massachusetts Safe Routes to School program supports several initiatives. Past initiatives have included “Walking School Bus”, “Footloose Fridays”, “Fuel up to Play” and several educational campaigns.

The Massachusetts Safe Routes to School Program is a central source of safe route services to all interested schools in the state and currently provides services to 43% of public K-8 schools. The program provides safety training, classroom visits, presentations to parents and community members, special events, encouragement programs, free promotional items, infrastructure improvements and summer programs.

b) Age Friendly Initiatives

One of the main goals of the age-friendly movement is to eliminate physical and social barriers for older adults. Age-friendly communities support policies, services, and infrastructure to support and enhance residents’ physical and mental health throughout their lives. These efforts allow residents to continue to learn, grow and make decisions, remain mobile, to build and maintain a social network, and to contribute in meaningful and fulfilling ways to their communities.

In the Pioneer Valley Region, people over 65 are the fastest growing age group. Many of our communities are working to make safe and reliable transportation options a priority, including affordable and easy-to-use public transportation, walking and biking paths, and rideshare access.

In 2022, with a grant from Tufts Health Plan Foundation, PVPC began helping local communities achieve their AARP Age and Dementia Friendly designations and convene community and regional partners quarterly to hear from experts and share best practices in the designation, assessment, and implementation of strategies to make communities great places to live for people of all ages. Community partners include Agawam, Amherst, Belchertown, Hadley, Monson, Northampton, Palmer, South Hadley, and Ware.

4. Advocacy and Local Organizing Committees

The Pioneer Valley has a long history of strong support and advocacy for bicycling. RadSpringfield is a volunteer-run bike shop in Springfield. Springfield is the largest city in New England without a commercial bike shop and RadSpringfield fills for the purchase of bikes, skill development and community.

Several communities in the Pioneer Valley have established bike advocacy or trails groups that volunteer their time and expertise to promote and improve

bicycle facilities while supporting a strong bicycle culture. Some of these include, Williamsburg Mill River Greenway Committee, Holyoke Bike/Walk Committee, Walk/Bike Springfield, UMass Cycling Club, Pioneer Valley NEMBA, Friends of the Belchertown Greenway, Brimfield Trail Association, MassCentral Rail Trail Coalition, East Quabbin Land Trust, Northampton Cycling Club, [Springfield Cyclonauts](#), [MassBike Pioneer Valley](#), [Friends of the Columbia Greenway Trail](#), [Friends of the Manhan Rail Trail](#), [Friends of Northampton Trails](#).

a) Mass-in-Motion

Mass in Motion is a statewide program that “promotes opportunities for healthy eating and active living in the places people live, learn, work and play.” Sixty communities across the state are Mass in Motion communities. Eight of those are in the Pioneer Valley Region and include Amherst, Belchertown, Northampton and Williamsburg (working under the name, Healthy Hampshire), Holyoke, Springfield, and West Springfield and Palmer. The City of Northampton is the lead agency for the four 'Healthy Hampshire' communities, and the cities of Holyoke and Springfield secured funds directly from the Massachusetts Department of Public Health (MDPH). The Pioneer Valley Planning Commission collaborated with the health agents in Palmer and West Springfield, to help these communities become Mass in Motion communities.

These cities and towns are actively working toward health in all policies, increasing awareness of walking and bicycling opportunities in the community, improving safety for walkers and bicyclists, and working to increase access to healthy food through community gardens, working with local restaurants to assure healthy dining options and working with corner stores to assure healthy food options throughout each community.

5. Recreational Activities

Nestled among the forests, farmland, and mountains on the banks of the Connecticut River, the Pioneer Valley is ideally suited for recreational hiking and biking. Our small towns and larger city neighborhoods are where you find great coffee shops, historically preserved buildings, fun music, crowds of young and the young at heart, a strong local food movement, first-rate museums and art galleries, eccentric shops, eclectic restaurants, and residents eager to get outdoors in any season.

a) Regional Hiking Trail Map and Other Guides

The popularity of bicycling in the Pioneer Valley has led to the creation of a several guidebooks specific to the region including the Rubel Bike Map to Western Massachusetts, Bicycle Touring in the Pioneer Valley (Nancy Jane),

Bicycling the Pioneer Valley (Marion Gorhan), Touring Jacob's Ladder by Bicycle or Car (PVPC) and Jacob's Ladder Trail Western Region Off-road Bicycle and Trail Guide (PVPC).

The "Pioneer Valley Trails: A Hiking and Biking Guide," is for sale at area bookstores and outdoor recreation retailers. The guide shows the locations of many hiking and biking trails in Hampden and Hampshire counties. The guide features a map on one side, showing the locations of 47 trails. The reverse side includes descriptions of each of the trails, including their location, whether they are paved or off-road, the length, types of permitted uses, and parking information. The guide is available many bookstores throughout the region and also available online at <http://www.pvpc.org/sites/default/files/2010-trail-hike-guide-sml.pdf>.

b) Tourism and Commerce

The growing support of regional cycling businesses is testimony to the unique quality and growing popularity of bicycling in the Pioneer Valley. The region is also home to a local fixed base touring companies such as [River's Edge Cycling](#) and hosts nationally ranked races such as the [Verge Northampton International Cyclocross](#).

Local bicycle shops provide a critical supporting role and many are active advocates and partners in the community and many such as New Horizons Bikes in Westfield have hosted numerous events, [annual rides](#), and activities during bike week. Joe's Garage in Haydenville, Competitive Edge, Northampton Bicycle, Full Circle Bike Shop, Peak Performance Bicycles, Pro Bike, FJ Roberts, Valley Bike & Ski Werks, Hampshire Bicycle Exchange, New England Bicycle, Custom Cycle Bike Shop and Laughing Dog Bicycles are just a few of the many bike shops that play a critical role in supporting a vibrant cycling economy.

6. Massachusetts Pedestrian Plan

MassDOT completed an update to the statewide Pedestrian Plan in 2019. The plan identifies a set of initiatives and related actions to address identified needs. The six initiatives include:

- Initiative 1: Promote pedestrian safety, accessibility, and connectivity in investment decision-making and project development.
- Initiative 2: Establish a set of prioritized pedestrian projects on MassDOT-owned roadways and bridges to address critical safety, accessibility, and connectivity gaps.
- Initiative 3: Slow vehicle speeds and improve visibility of people walking.
- Initiative 4: Improve pedestrian accessible paths of travel to transit.

- Initiative 5: Launch a year-round maintenance and operations plan for MassDOT-owned pedestrian facilities and support municipalities to do the same.
- Initiative 6: Invest in data collection to inform initiatives 1-5 and to track progress.

In addition to the Plan, a companion document was created, called the [Municipal Resource Guide for Walkability](#). The purpose of the guide is to support cities and towns in their efforts to improve walkability.

7. MassDOT's ADA/Section 504 Transition Plan

MassDOT completed a comprehensive evaluation of its policies, programs, services and facilities to determine the extent to which individuals with disabilities may be restricted in their access to these services and activities. MassDOT's ADA/Section 504 Transition Plan guides the planning and implementation of necessary program, activity, and facility modifications over the next several years. This work has included an extensive inventory of sidewalk ramps on jurisdictional roadways (over 35,000 ramps) as part of the ADA/Section 504 Self Evaluation and Prioritization. The data from this inventory is available on Cartegraph VersaView.

I. AVIATION

The Pioneer Valley is well served by air transportation facilities located within or adjacent to the region. Most air travel from the region goes through Bradley International Airport in Windsor Locks, Connecticut situated 15 miles south of the City of Springfield. Boston Logan International Airport is also in common use by residents of the Pioneer Valley even at a distance of 93 miles from Downtown Springfield.¹⁹

Within the Pioneer Valley there are also a number of airports, the largest of which is the Westover Air Reserve Base and Metropolitan Airport facility in Chicopee and Ludlow. The second largest airport in the region is Westfield-Barnes Airport located and operated by the City of Westfield. It is the third busiest airport in Massachusetts, a general aviation facility home of the Air National Guard 104th Tactical Fighter Group.

The remaining airport in the region, the Northampton Airport, is privately owned and operated with much smaller and less sophisticated facilities. This airport serves both business and recreational uses.

¹⁹ Boston Logan Airport is not covered under this report. Please reference applicable materials through MassPort at <https://www.massport.com>.

1. Public Airports

a) Bradley International Airport

Bradley Airport located in Windsor Locks, Connecticut, is a state-owned facility that is operated by the Connecticut Airport Authority (CAA). It is New England's second largest airport, serving Connecticut, Massachusetts, New York, Vermont and New Hampshire, and was designed as a medium hub airport by the Civil Aeronautics Board. The airport opened as an Army Air Corps Base in 1941 acquired from tobacco farmers after the Great Depression. After World War II it was taken over by the State of Connecticut and was converted to a commercial facility under the name Bradley Field. The name was changed to Bradley International Airport in the 1960s after a 9,500 foot paved runway was opened to accommodate jet aircraft. There are currently three runways and 17 taxiways. The total land area of the airport is approximately 2,000 acres.

The airport is the principal commercial airport serving people traveling to and from the Pioneer Valley Region. Breeze serves Bradley International Airport as one of the major hubs. The airline aims to provide nonstop flights between underserved routes throughout the U.S. Two international carriers, Aer Lingus and Air Canada have dedicated gates. Other airlines with dedicated gates include American Airlines, Delta, United Airlines, Southwest, JetBlue, Spirit Breeze, Sun Country Airlines. Frontier offers flights but does not have a dedicated gate.

Approximately 227 (FY2022) daily flights make Bradley the second busiest New England Airport behind Logan International Airport in Boston. The airport boasts nearly 7 million passengers served in 2019, 7 years of consecutive year-over-year growth and is the second largest airport in New England²⁰.

Table A5-17 – Bradley Airport Operational Statistics - FY2022

Aircraft	#	Aircraft Operations	Percent
Aircraft Based on Field	64	Average Flights/Day FY2022	227
Single Engine Airplanes	2	Commercial	64%
Multi Engine Airplanes	1	Transient General Aviation	16%
Jet Airplanes	33	Air Taxi	14%
Helicopters	6	Military	5%
Military Aircraft	22	Local General Aviation	1%

Source: <http://www.airnav.com/airport/KBDL>

²⁰ Bradley International Airport. (2020, March). *BDL Capital Display*. Retrieved February 22, 2023, from Bradleyairport.com: <https://bradleyairport.com/wp-content/uploads/2020/03/BDL-Cptl-Display-2020-Web-2.pdf>

Beyond commercial passenger services, Bradley International Airport offers the following services:

- Bombardier and Embraer have service centers on premises.
- Regular Air Cargo Operators on the premises includes UPS, DHL, FedEx and Amazon.
- Fixed-Based Operators who provide support on the ground at Bradley International Airport include Atlantic Aviation BDL, Signature Flight Support BDL Total Airport Services and Aircraft Service International Group.

Most recently, Bradley International Airport redeveloped ground transportation access with a new parking garage, taxi stands, and rental car stations; a development they call the new Transportation Center. This center also hopes to offer better connection to public transit buses²¹.

b) Westfield-Barnes Municipal Airport

Westfield-Barnes is a public airport operated by the City of Westfield and is the home base for the Massachusetts Air National Guard 104th Fighter Wing. The Region's second largest airport is located within the boundaries of the City of Westfield, north of Westfield's central business district and adjacent to the Massachusetts Turnpike (I-90). The airport is also within minutes of I-91. A total of about 1200 acres are owned by the facility. Approximately 600 acres are presently developed with pavement, hangers and airport buildings.

The airport is classified by the Massachusetts Airport System Plan as a general aviation airport providing general aviation service. It serves virtually all aircraft, including commercial jet liners and large, heavy and wide body aircraft. It is capable of handling precision instrument approach operations. The airport consists of two asphalt runways.

Table A5-18 – Barnes Airport Operational Statistics – FY2022

Aircraft	#	Aircraft Operations	Percent
Aircraft Based on Field	124	Average Flights Per Day	131
Single Engine Airplanes	86	Transient General Aviation	41%
Multi Engine Airplanes	6	Local General Aviation	44%
Jet Airplanes	4	Military	12%
Military Aircraft	26	Air Taxi	2%
Helicopters	1	Commercial	<1%
Ultralights	1		

Source: www.airnav.com/airport/KBAF

²¹ CBIA. (2022, July 14). *Bradley International Airport Opens \$210M Transportation Center*. Retrieved January 22, 2023, from cbia.com: <https://www.cbia.com/news/economy/bradley-international-transportation-center/>

Table A5-19 – Bradley Airport Nonstop Flights by Commercial Carrier

CITY	CALL SIGN	DELTA	FRONTIER	SOUTHWEST	JETBLUE	BREEZE	AMERICAN	UNITED	AERLINGUS	SPIRIT	SUN COUNTRY	AIR CANADA
ATLANTA, GA	ATL	X	X									
BALTIMORE, MD	BWI			X								
CANCUN (MEXICO)	CUN	X	X		X							
CHARLESTON, SC	CHS					X						
CHARLOTTE, NC	CLT						X					
CHICAGO, IL (MDW)	MDW			X								
CHICAGO, IL (ORD)	ORD						X	X				
COLUMBUS, OH	CMH					X						
DALLAS-FORT WORTH, TX	DFW						X					
DENVER, CO	DEN		X	X				X				
DETROIT, MI	DTW	X										
DUBLIN (IRELAND)	DUB								X			
FT. LAUDERDALE, FL	FLL			X	X							
FORT MYERS, FL	RSW			X	X	X				X		
HOUSTON, TX	IAH							X				
JACKSONVILLE, FL	JAX					X						
LAS VEGAS, NV	LAS		X		X	X						
LOS ANGELES, CA	LAX				X							
MIAMI, FL	MIA				X		X					
MINNEAPOLIS, MN	MSP	X									X	
MONTEGO BAY (JAMAICA)	MJB									X		
MYRTLE BEACH, SC	MYR									X		
NASHVILLE, TN	BNA			X								
NEW ORLEANS, LA	MSY					X						
NEW YORK, NY	LGA	X										
NORFOLK, VA	ORF					X						
ORLANDO, FL	MCO		X	X	X					X	X	
PHILADELPHIA, PA	PHL						X					
PHEONIX, AZ	PHX					X						
PITTSBURGH, PA	PIT					X						
RALEIGH-DURHAM, NC	RDU	X	X			X						
RICHMOND, VA	RIC					X						
SAN JUAN, PR	SJU		X		X							
SARASOTA/BRADENTON, FL	SRQ					X						
SAVANNAH, GA	SAV					X						
TAMPA, FL	TPA			X	X	X				X		
TORONTO, ON (CANADA)	YYZ											X
VERO BEACH, FL	VRB					X						
WASHINGTON, DC (IAD)	IAD							X				
WASHINGTON, DC (DCA)	DCA						X					
WEST PALM BEACH, FL	PBI			X	X							

Source: <https://bradleyairport.com/journey/non-stop/>

Land-side development is concentrated in three quadrants: The Southwest quadrant, houses general aviation functions as well as fixed-base operators, based aircraft storage facilities, transient aircraft parking, and airport and Federal Aviation Administration administrative facilities.

The Northwest quadrant consists of the land leased to the Massachusetts Air National Guard (MANG) and Army Aviation Services. Located within this quadrant are the MANG facilities, aircraft parking aprons, alert facilities, hangars, operations buildings, and office space. The F-15's on base now have a 24/7 air sovereignty alert mission. An industrial park is also planned for this area of the airport. In addition, the army aviation support facility operates here with two large hangars, 6 Blackhawk helicopters and 2 operations buildings.

Up until September 2007, the 131st Fighter Squadron (131 FS), 104th Fighter Wing (104 FW) of the Massachusetts Air National Guard at Westfield, operated 25 A-10 Thunderbolt II aircraft until they were realigned through the Department of Defense Base Realignment and Closure (BRAC) of 2005. The 104th changed its mission from Close Air Support to Air Superiority, and its A-10 aircraft were redistributed to other fighter units as a result of BRAC. The 104 FW has now received 15 F-15 Eagles from the former 102nd Fighter Wing.

The Northeast quadrant is the home of General Dynamics Aviation Services, a subsidiary of Gulfstream, which provides a full-service maintenance facility to corporate aircraft with its four hangars and one support facility.

Atlantic provides Fixed-Based Operator services at Westfield-Barnes. Services include refueling, rental car coordination, restrooms and showers, snooze rooms, Wi-Fi and catering.

For more information on the airport please visit their website <http://www.barnesairport.com>

c) Westover Air Reserve Base and Metropolitan Airport

Westover is a Joint-use Civilian and Military airport. Located in the City of Chicopee the Westover Airport is strategic to the State and Federal aviation systems. Situated in the heart of the "Knowledge Corridor" in Western Massachusetts, with a population of 600,000 within a thirty-mile radius, Westover Airport is a unique public use airport. While Westover's main runway is large enough to have been on the list of backup locations for landing the Space Shuttle, the airfield remains spacious enough for virtually any type of aircraft. It is also flexible enough to welcome the emergence of the Very Light Jet era and all other General Aviation air traffic.

Opened originally in 1940 as a World War II training base geographically positioned for European missions, the airport is one of the nation’s most successful Joint-use, Civilian and Military facilities. Westover continues its Military use as home to the Air Force Reserve’s 439th Airlift Wing. Under the Joint-use agreement the US Air Force retains the responsibilities for the runways, two Instrument Landing Systems (ILS), and a state-of-the-art air traffic control tower. The Westover Airport (civilian) has responsibility for 3 taxiways, its 13 large hangars, a fully equipped passenger terminal and overall civilian aviation operations.

Westover Airport is a navigational hub, located between Boston, Albany and the greater New York City region. By air, all major North American and Western European cities easily reached within hours. The global marketplace is within easy reach of Westover Airport. Westover Airport proudly demonstrates daily its importance to our region’s economy and the State’s transportation system.

For a time, JetBlue offered connecting services to Bradley International Airport and Logan International.

Table A5-20 – Westover Airport Operational Statistics

Aircraft	#	Aircraft Operations	Percent
Aircraft Based on Field	38	Average Flights Per Day	46
Single Engine Airplanes	12	Military	60%
Multi Engine Airplanes	4	Local General Aviation	27%
Jet Airplanes	3	Transient General Aviation	9%
Helicopters	1	Air Taxi	4%
Glider Airplanes	2	Commercial	<1%
Military Aircraft	16		

Source: <http://www.airnav.com/airport/KCEF>

Westover Airport runway system is long enough to accommodate all types of aircraft. Its primary runway 5-23 is 11,597 feet long by 300 feet wide and includes two Instrument Landing Systems. The Airport’s second runway, 15-33, is 7,081 feet long by 150 feet wide. These runways provide pilots with a safe approach during variable wind and weather.

The Westover Metropolitan Development Corporation (WMDC) is the Civil Airport Authority that holds the FAA Part 139 Airport Operating Certificate. The WMDC was organized in 1974 to facilitate the conversion of former Military property at Westover to constructive Civilian re-use. It is a public non-profit corporation governed by an autonomous nine-member Board of Directors.

Over the past forty years, WMDC has successfully developed three industrial Air Parks in both the Town of Ludlow (Air Park East) and the City of Chicopee

(Air Parks/North & West). The three Air Parks have more than 55 industries employing over 4,000 skilled workers. A new Air Park consisting of 88 acres of land owned by WMDC and located south of the airport is currently in the early stages of site development.

The Westover Airport facilities include a Passenger Terminal with adjacent parking lots for 260 vehicles with plenty of room for expansion. On the airfield side of the terminal building there is a reinforced concrete apron over five acres in size to handle aircraft parking for arrivals and departures. In addition, there are 13 large aircraft hangars, ranging in size from 28,600 to 31,500 square feet with 28-foot-high doors to accommodate based aircraft and transients.

The WMDC has proactively initiated efforts to protect the air space around Westover through participation in a FAA Part 150 Noise Study Program. A Noise Exposure map has identified the properties most impacted by aircraft noise and the program gives those eligible property owners the option to participate in the voluntary acquisition of their property. A total of 62 parcels and over 223 acres have been acquired through 2017. The funding of the program is provided by the FAA, MassDOT Aeronautics Division and a local matching share from WMDC. WMDC plans to continue the Noise Program into the future, which may have a sound insulation component.

The Donahue Institute published the Westover Metropolitan Development Corporation Economic Contributions report on November 30, 2021. The report concludes that Westover Airport provides a \$1.2 Billion impact on the Massachusetts economy, with nearly 8,500 jobs created as a result.

For more information on the airport please visit their website at <http://www.westoverairport.com/>

2. Private Airports

a) Northampton Airport

The Northampton Airport, operating under the names of both Paradise City Aviation and Pioneer Valley Balloons in the past, is privately owned and operated. In August 2004, a local corporation, Seven Bravo Two, LLC purchased the assets of the airport. Along with this purchase, a new flight school/fixed-based operator office was established at the airport know as Northampton Aeronautics, Inc. The airport has been running since the early 1920's and became an official airport on April 1, 1929. It is classified as a Basic Utility II airport that serves general aviation uses, both business and recreational. Located in the City of Northampton, the airport covers 55 acres, has one asphalt runway 3,365 feet long and 50 feet wide with variable high intensity, pilot operated runway lighting. Northampton Airport has an

estimated 85 flights per day and an estimated 60 based aircraft. The runway underwent a \$1.2 million reconstruction in 2000. In spring of 2010 the ramp in front of the maintenance hangar was expanded allowing for more operating space. A new hangar was built in 2010. Northampton Airport offers 24-hour self-service fueling, and minor and major maintenance services. The airport is closed to aircraft and helicopters with a gross operating weight in excess of 12,500 lbs. Seaplanes can operate on the Connecticut River, which is parallel to the runway.

Table A5-21 – Northampton Airport Operational Statistics – FY2022

Aircraft	#	Aircraft Operations	Percent
Aircraft Based on Field	84	Average Flights Per Day	116
Single Engine Airplanes	77	Local General Aviation	97%
Multi Engine Airplanes	4	Transient General Aviation	3%
Helicopters	1	Military	<1%
Gliders	2	Air Taxi	<1%

Source: <http://www.airnav.com/airport/7B2>

The Northampton Airport normally employs between 15 and 17 employees with as many as 30 during the peak summer months. Besides its large commercial business, the airport has chartered flights flying 24 hours a day, 7 days a week to destinations all over the country. It also has an FAA approved part 141 flight school, which is the largest flying school in Western Massachusetts.

For more information on the airport please visit their website at <http://www.northamptonairport.com/>

J. TRANSPORTATION OF GOODS

The major interstates and rail lines in the Pioneer Valley Region enable the quick delivery of goods to some of the world’s largest economies of New York, Boston, and Philadelphia. The region’s economics are also influenced by the surrounding mid-sized cities such as Albany, Hartford, Worcester, and New Haven. The proximity of these major and middle-sized cities allows goods from the Pioneer Valley to be quickly transported to competitive markets.

Freight is moved in and out of the Pioneer Valley primarily by truck with rail, air and pipeline carrying the remaining goods. Freight shipments within, from, and to the state of Massachusetts are summarized in Table 5-22 by domestic mode share for 2007, 2012 and 2015. The truck continues to be the dominant mode for transporting freight.

The Massachusetts Freight Plan is a planning document that defines short and long-term vision for the freight system in the Commonwealth. Last updated in 2017, the Plan defines how freight functions today and offers a roadmap as to how policymakers and users of the freight system can make improvements. [Freight Plan | Mass.gov](#).

MassDOT has started the process to update the Freight Plan. The Freight Advisory Committee was reconvened, and a series of virtual meetings have been completed between February – March 2023 to discuss various topics including safety, access to employment, small business needs, and general freight industry trends and challenges.

a) Regional Freight Plan

The Pioneer Valley Regional Freight Plan identifies freight needs, reviews existing conditions of the current freight network, and assesses future potential for improvement and expansion of freight in coordination with the Massachusetts Freight Plan. Completed in 2020, the plan aims for enhanced access to intermodal facilities and increased collaboration between various stakeholders to spur economic development within the region. The plan can be accessed through this link: [Final regional freight plan.pdf \(pvpc.org\)](#).

2. Trucking

Trucking is the dominant mode for moving freight in the Pioneer Valley. The majority of private carriers in the region are small, short haul carriers handling feeder and distribution traffic. They provide both full truckload and less than truckload deliveries. This mode has the ability to transport goods to the northeastern United States and southeastern parts of Canada by overnight service. These freight companies carry goods for a variety of industries outside Hampden and Hampshire County. The future competitiveness of the industry hinges on the investment in the maintenance and development of interstate, state and local roadways, multimodal facilities and all related infrastructure.

Major trucking routes tend to follow Interstate 91 and Interstate 90 in the region. While the interstate routes carry the highest amount of truck traffic, trucks typically provide the final trip between freight terminals, manufacturers, or distributors. As a result, it is important to maintain efficient freight corridors to assist in the transportation of goods in the Pioneer Valley.

Table A5-22 – Shipments (tons) Within, From, and To Massachusetts by Trade Type & Mode

Trade	Mode	Within Massachusetts				Outbound From Massachusetts				Inbound To Massachusetts			
		2017	2018	2019	2020	2017	2018	2019	2020	2017	2018	2019	2020
Domestic	Air (include truck-air)	0.0	0.0	0.0	0.0	26.0	26.0	25.9	25.1	29.0	29.6	29.2	28.1
	Multiple modes & mail	235.5	234.4	229.4	216.6	1,906.4	1,912.4	1,894.7	1,787.2	4,024.9	4,079.9	4,008.3	3,884.2
	Pipeline	14,411.9	13,803.4	12,480.0	11,166.1	2,096.6	2,007.8	2,136.5	2,128.3	10,592.1	11,461.6	11,712.0	11,430.0
	Rail	78.7	77.9	76.3	74.9	606.5	607.9	607.5	606.3	1,289.3	1,277.9	1,307.2	1,285.5
	Truck	109,418.8	110,604.1	107,644.7	101,278.2	45,121.1	45,133.9	43,978.7	40,251.2	38,887.0	39,225.8	38,449.6	36,854.0
	Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.4	57.0	57.6	48.2
	Total	124,144.9	124,719.8	120,430.4	112,735.9	49,756.6	49,687.9	48,643.2	44,798.1	54,878.7	56,131.7	55,563.8	53,530.0
Export	Air (include truck-air)	0.0	0.0	0.0	0.0	31.7	51.5	67.8	65.7	2.7	4.8	3.5	2.4
	Multiple modes & mail	0.2	1.7	1.1	2.7	146.3	178.5	162.1	162.8	30.4	17.3	19.8	14.8
	Other and unknown	74.1	348.9	426.9	363.3	63.5	0.3	0.0	0.0	83.5	0.0	0.0	0.0
	Pipeline	0.0	0.0	0.0	0.0	0.0	0.0	139.4	0.0	0.0	0.0	0.0	0.0
	Rail	635.7	199.4	109.7	129.5	254.2	344.0	195.9	190.2	47.9	23.3	29.1	24.2
	Truck	1,092.2	565.3	496.0	587.7	2,360.1	2,214.4	2,248.6	2,273.0	189.4	159.4	148.9	124.8
	Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	5.7
	Total	1,802.2	1,115.3	1,033.6	1,083.1	2,855.8	2,788.7	2,813.8	2,691.6	353.9	205.1	201.6	171.9
Import	Air (include truck-air)	0.0	0.0	0.0	0.0	9.2	6.2	6.3	5.1	43.5	37.4	40.5	37.4
	Multiple modes & mail	16.4	0.1	5.9	84.3	426.5	249.6	147.1	84.3	422.3	362.6	402.3	487.7
	Other and unknown	1.0	2.3	8.9	1.3	0.1	0.0	2.6	0.3	9.2	0.0	0.2	0.2
	Pipeline	0.0	378.0	625.2	408.3	0.0	0.0	0.0	0.0	1,487.1	3,381.3	3,260.4	2,624.5
	Rail	258.6	273.8	384.3	444.8	452.7	1,067.0	347.9	504.3	2,055.2	2,126.4	2,329.7	1,806.7
	Truck	5,515.8	3,883.2	6,033.1	6,470.7	5,096.1	3,685.2	1,853.3	565.6	3,570.7	3,171.6	3,142.7	3,155.4
	Water	4.0	0.0	0.0	0.0	85.6	136.6	41.6	59.7	33.8	0.0	31.0	46.5
	Total	5,795.7	4,537.5	7,057.4	7,409.5	6,070.3	5,144.6	2,398.8	1,219.4	7,621.6	9,079.4	9,206.9	8,158.4

Source: FAF Version 5.4.1

a) Critical Freight Corridors

The National Highway Freight Network (NHFN) is defined by FHWA to prioritize routes critical to interstate commerce. Critical Urban and Rural Freight Corridors (CRFCs and CUFCs) provide connectivity to the NHFN for manufacturers and consumers. The Pioneer Valley MPO is responsible for designating public roads for the CRFCs and CUFCs in accordance with the FAST Act. The CRFCs and CUFCs for the Pioneer Valley were designated by the MPO on May 23, 2017, and summarized in Table 5-23.

Table A5-23 – Critical Freight Corridors in the Pioneer Valley MPO

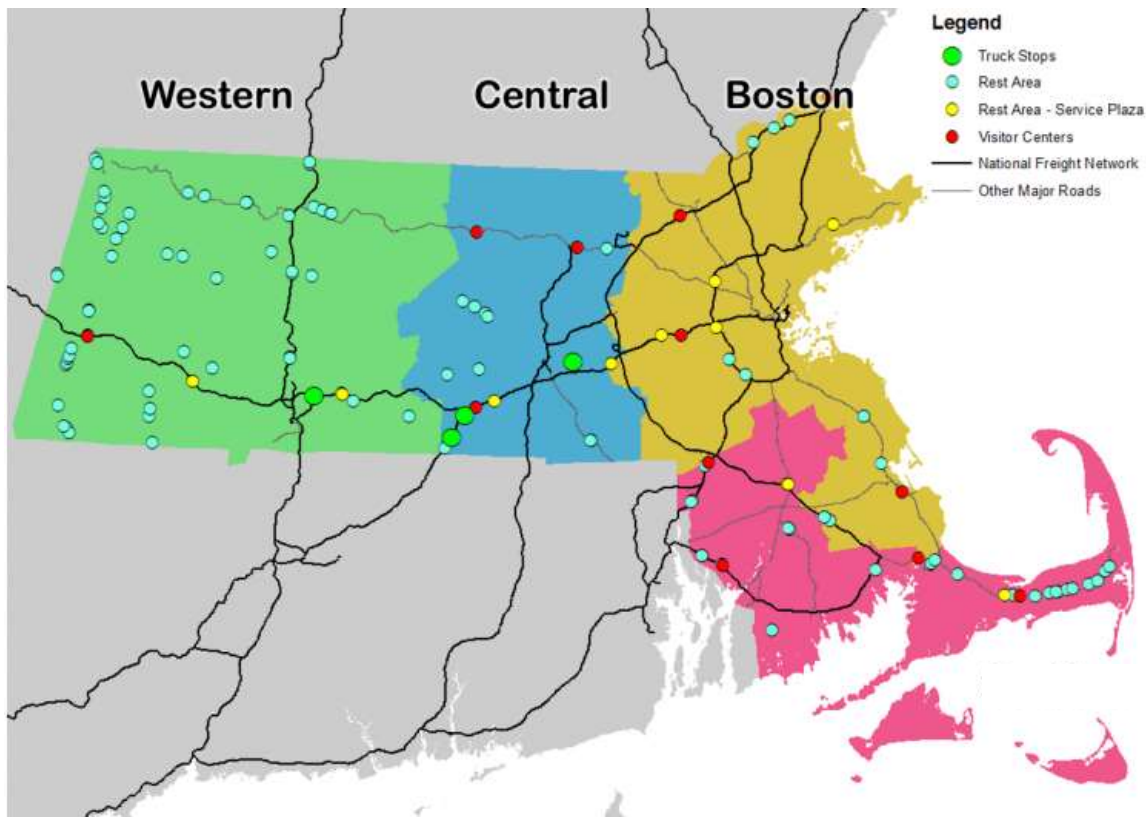
Critical Rural Freight Corridors					
Rte Number	Street Name	Town	Start	End	Length
Rte 5	West St	Hatfield	Church Ave	Plain Rd	2.25
Rte 112	Worthington Rd	Huntington	County Rd	Rte 20	2.02
Rte 32	Ware Rd	Palmer	Old Warren Rd	Old Belchertown Rd	4.41
Rte 202	Daniel Shays Hway	Belchertown	Allen Rd	Shutesbury Line	8.12
Rte 20	Huntington Rd/Russell Rd	Russell/Huntington	Rte 112	Rte 23	6.12
				TOTAL	22.92
Critical Urban Freight Corridors					
Rte Number	Street Name	Town	Start Point	End Point	Length
Rte 10/202	Southampton Rd	Westfield	Rte 202 N Apremont Way	I-90 Exit 41	2.93
	South St	Ware	Benham Ave	Rte 9/32	0.62
	Damon Rd	Northampton	King St	I-91 Exit 25/Rte 9	0.98
	Cottage St	Springfield	Roosevelt Ave	Berkshire Ave	1.53
	Garden St	Agawam	Bowles Rd	Rte 57	0.55
	Roosevelt Ave	Springfield	Bay St	Page Blvd	0.89
Rte 5	West St/N King St	Hatfield/Northampton	Elm St	Linseed Rd/Church Ave	0.71
Rte 20/32/181	N Main/Thorndike St	Palmer	Holbrook St	I-90 Exit 63	1.2
	Burnett Rd	Chicopee	New Lombard Rd	I-90 Exit 51	0.29
				TOTAL	9.7

b) Rest Stops

Drivers of commercial motor vehicles must follow strict hours of service regulations established by the Federal Motor Carrier Safety Administration (FMCSA). As a result, safe, convenient rest areas are important for long-haul drivers to meet hours of service regulations. MassDOT rest areas in the Pioneer Valley region are shown in Figure 5-17.

In addition, the Pride Traveler Center is located on Burnett Road in the City of Chicopee off Massachusetts Turnpike Exit 51. Another private truck stop with an associated rest area is in the City of Westfield off Massachusetts Turnpike Exit 41. PVPC staff has started to document usage of regional truck rest stops. These truck rest stops are described below:

Figure A5-17 – MassDOT Rest Areas

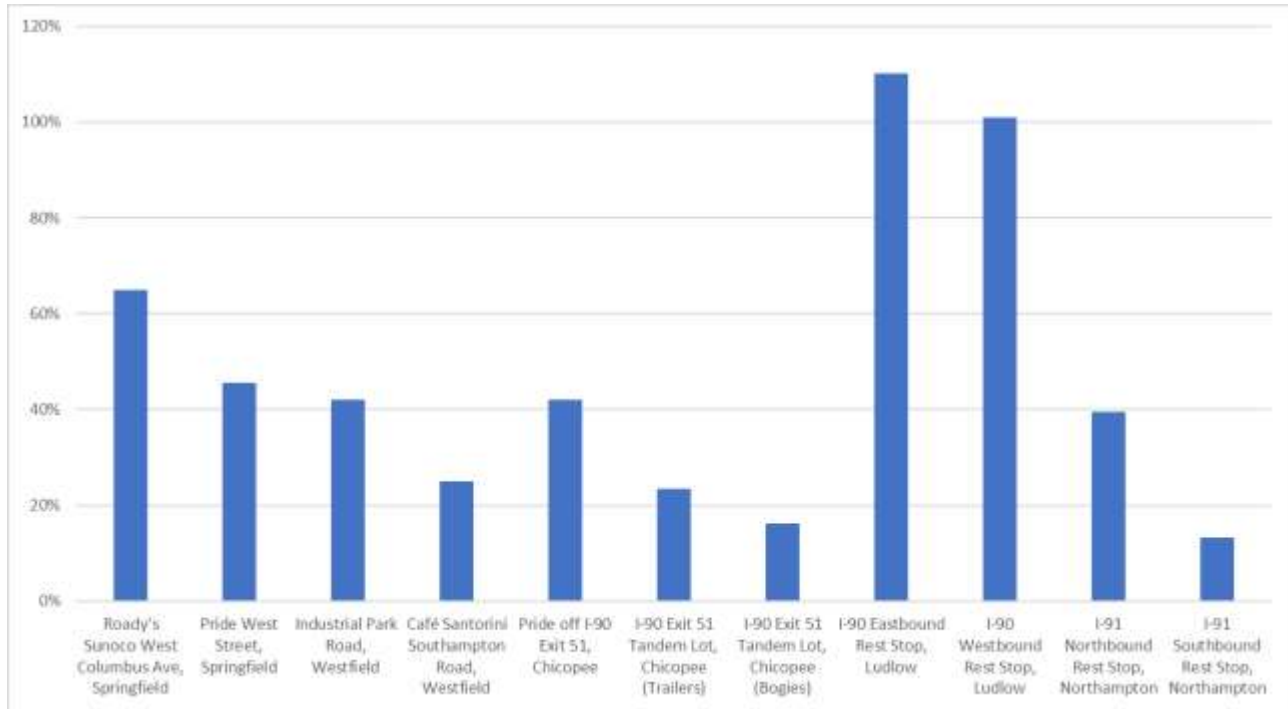


Source: MassDOT

- **Pride Truck Stop in Chicopee**—Located directly off of Exit 51 for the Massachusetts Turnpike, this privately operated facility features a gas station, restaurant, and weigh station. There are a total of 157 parking spaces. There is a fee for parking after 3 hours.
- **Pride Truck Stop in Westfield**—Located directly off of Exit 41 for the Massachusetts Turnpike, this lot has a total of 38 parking spaces. Parking is free but signs restrict overnight parking to no more than 3 consecutive nights.
- **Pride Truck Stop in Springfield**—Located directly off of Interstate 91 Exit 7B on Route 20, this privately operated facility features a gas station, convenience store, and weigh station.
- **Massachusetts Turnpike Service Plazas in Ludlow and Blandford**—There are no marked truck parking spaces for the Massachusetts Turnpike Service Plazas in Blandford and Ludlow, MA. Trucks park in unmarked spaces along the guardrail/fence in the front and back of the plaza.
- **I-91 Rest Areas in Northampton**—Trucks are allowed to park in both of these small rest areas but there are no formally marked spaces. No other services are provided.

There are also numerous “informal” lots, often large retail parking areas near major highway access points. A summary of average weekday usage of known truck rest areas in the Pioneer Valley is presented below.

Figure A5-18 – Truck Stop Average Daily Daytime Occupancy 2018-2023

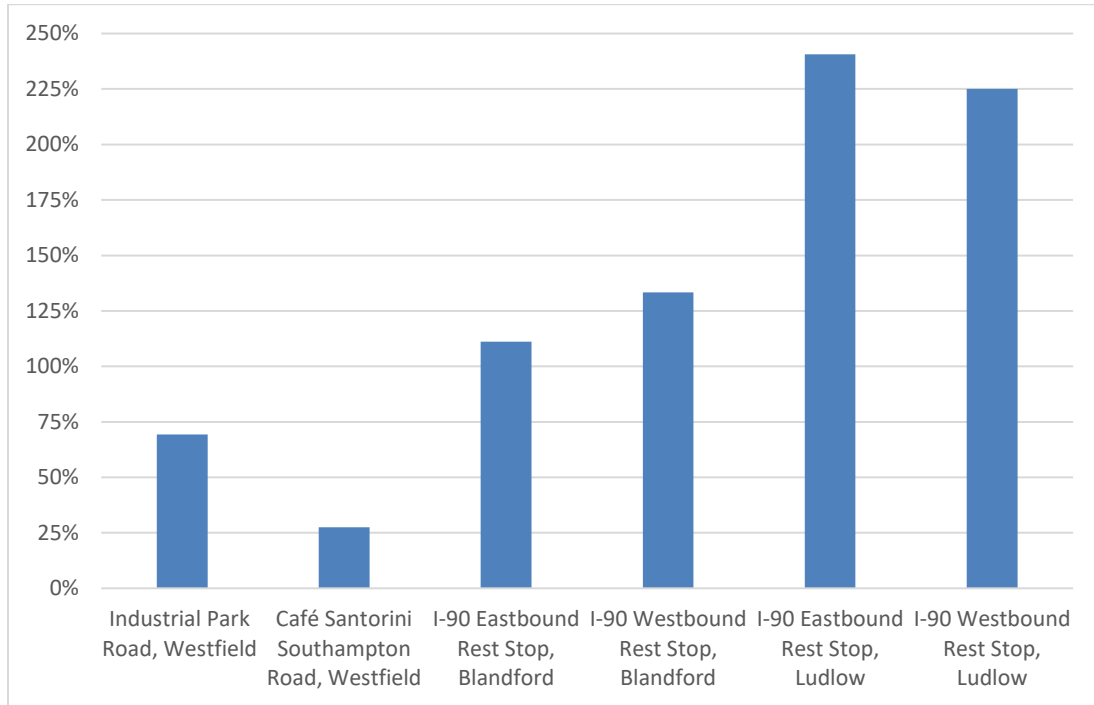


A total of ten parking areas are counted by PVPC staff to identify truck parking requirements during daytime hours. Maximum lot occupancy was estimated for most truck parking areas as they do not have marked parking spaces. The tandem trailer parking lot off I-90 Exit 51 is summarized by parked trailers and parked trailer connectors, also called “bogies.” Most parking lots have available parking for trucks during daytime hours. The notable exceptions are the I-90 rest areas in Ludlow, MA. These lots do not have marked truck parking areas. Most trucks park along the guardrail and fence in the front and back of the rest area.

A nighttime truck parking count was conducted after 9 pm for six popular truck parking areas. This data collection was initiated based on conversations with local truck drivers who reported a great demand for truck parking during nighttime hours. Parking demand exceeds the estimated supply at four of the locations. As stated previously, the I-90 rest areas do not have marked parking spaces for trucks. Most trucks park behind the rest area near the fueling stations. As demand increases, trucks begin to park parallel to each

other creating difficulties for trucks to drive to the fueling station and for truck drivers to safely walk to their vehicles.

Figure A5-19 – Truck Stop Average Daily Nighttime Occupancy 2019-2022



In Chicopee, the occupancy ratio during the day was 37% but increased to 56% at night. Night truck use in Ludlow at the rest stop near Exit 7 along I-90 was double the daytime use and greatly exceeded the capacity of marked spaces for both rest areas. Reviewing the nightly truck occupancy data at truck stops and rest areas showed a need for continued data collection efforts to establish average annual daily occupancy night counts.

This preliminary data clearly shows a need for more truck parking at the I-90 service plaza in Ludlow in both directions. It is recommended that MassDOT review the existing layout of the Ludlow rest areas to identify options to accommodate trucks during hours of darkness. PVPC will continue to monitor these rest areas and expand data collection to other regional rest areas during nighttime hours.

3. Rail

Five rail carriers provide freight service in the Pioneer Valley Region: CSX Transportation, Springfield Terminal Railways, New England Central, Pioneer Valley Railroad, and MassCentral Railroad.

a) CSX Transportation

CSX is a Class 1 railroad that owns and operates the east-west mainline between Selkirk, New York, and Boston. CSX also owns and operates a spur line between Springfield and Ludlow. In addition, CSX owns and operates the West Springfield intermodal rail yard.

b) Springfield Terminal Railways

In 2022, the Surface Transportation Board approved the sale of Pan Am Railways to CSX creating the Springfield Terminal Railways which is jointly owned by CSX and Norfolk Southern. CSX now owns and operates the Boston and Maine (B&M) which is the region's second largest rail carrier, operating a north-south mainline along the Connecticut River from Springfield, to East Deerfield. CSX also owns secondary lines that run from Chicopee to Chicopee Falls and from Holyoke to Westover Industrial Airpark in Chicopee. Lying north of the region, but also important to the region's rail system is the B&M east-west mainline. This CSX line is now known as the Patriot Corridor. As part of the CSX purchase, Pan Am Southern will be operated by Springfield Terminal Railways until it is eventually taken over by Berkshire & Eastern Railroad (B&E), a subsidiary of Genesee & Wyoming.

c) New England Central

The New England Central Railroad (NECR) is owned by Genesee and Wyoming Railroad Services, Inc. and offers freight service between St. Albans, Vermont and New London, Connecticut via the eastern portion of the Pioneer Valley region. Although the line is not heavily traveled, it has been rehabilitated and operates profitably. In December of 2018 it was announced that NECR would be receiving \$10.8 million in Better Utilizing Investments to Leverage Development (BUILD) funding along with \$9.6 million from MassDOT. NECR will be investing \$9.6 million as well for a total of \$30 million to upgrade the 60 miles of track in Massachusetts to accommodate 286,000 lb. freight car standards.

d) Pioneer Valley Railroad

The Pioneer Valley Railroad (PVRR) is owned by the Pinsky Company and provides short line service on tracks formerly owned by Conrail. The PVRR took over two lines in 1982, each approximately 15 miles long, connecting Westfield with Holyoke and Northampton. The PVRR can accommodate intermodal transfers at the ends of each route, has 48-state motor carrier authority, and directly connects to both CSX and the B&M railroads.

e) MassCentral Railroad

MassCentral (Massachusetts Central Railroad Corporation) is an independent firm based in Palmer, Massachusetts. The operation of the railroad is managed by the Finger Lakes Railroad. Like PVRR, MassCentral Railroad provides short line service on a former Conrail line. Since 1979 this railroad has operated the former Ware River secondary line, which runs 24 miles from Palmer, through Ware, to North Barre, Massachusetts. MassCentral connects with CSX in Palmer. After abandonment by Conrail, the line was purchased and rehabilitated by the Commonwealth of Massachusetts. The Commonwealth maintains ownership of most of the line and leases the tracks to MassCentral.

f) Yards Terminals

The region's major freight and intermodal yard is located in West Springfield (CSX). CSX is currently making significant infrastructure improvements to the West Springfield facility. Another major freight and switching yard important to the region but located outside the region, is B&M's East Deerfield Yard in Franklin County. Within the Pioneer Valley other smaller freight yards are located in Holyoke, Palmer, and Westfield.

g) Services

Much of the freight moved in Massachusetts is interstate traffic with either Selkirk, New York (CSX) or Mechanicville, New York (Pan Am Southern) providing connections to long haul lines. In addition to traditional general freight (boxcar) service, all of the region's railroads offer contract rates for volume shipments, consultation services for custom-designed transportation packages, and intermodal freight facilities allowing the transfer of goods from rail to truck and vice versa. The geographic location of the Pioneer Valley at the crossroads of interstate highways (I-90 and I-91) and long-haul rail lines (CSX and B&M) creates a strategic and attractive location for businesses and industry participating in the local or international marketplace.

4. Air Freight

Air freight can be sent in two different methods. The first option would be to transport air freight by companies which own and maintain their own all-cargo aircraft fleet, such as AirNet or DB Schekner. The second option is via scheduled passenger aircraft for which the shipper places the cargo with a freight forwarding (pooling) company. The forwarder contracts for blocks of space on commercial airlines for specific routes. According to the U.S. Department of Transportation, for identification purposes, air freight services are categorized into whether goods are time sensitive, or less time sensitive; whether they are sent by integrated or nonintegrated providers; or by the

major type of cargo carrier, which are identified as being one of the following: express carrier, scheduled, mail or chartered air service providers.

Currently there are no major air freight facilities in the region. This lack of this particular regional shipment method does not limit the air freight and package services options for Pioneer Valley residents. Air freight inbound or outbound of the region typically travels through these airports: Bradley International Airport in Windsor Locks, Connecticut, Logan Airport in Boston, or New York City's metropolitan airports. Westover Metropolitan Airport in Chicopee, MA seldom has automotive or large machine parts shipments. This limited amount of freight is not tracked or reported by the airport.

Bradley International Airport is a medium-hub airport located 15 miles southwest of Springfield, MA, in Windsor Locks, CT. Bradley's convenient location near Interstate 91, and air cargo facilities, make it the primary choice for the region's shippers. In 2012, more than 122,000 tons of air cargo were enplaned or deplaned at Bradley International. Airport choice for air cargo transport is dependent on a number of factors, including destination coverage/schedule factors, tariff structure, logistical and contractual considerations, and access time and distance of individual airports. Therefore, some of the region's shippers may choose Boston's Logan airport, or one of New York City's metropolitan airports for air cargo services.

5. Pipeline

There are presently four pipeline companies operating lines in the Pioneer Valley. Three provide natural gas while the other provides petroleum products. Pipeline goods continue to be critical to the national and regional economy. These lines provide energy resources for buildings, motor vehicles, airports and power plants to maintain the economy and existing infrastructure. Roughly 79 miles of pipeline are active. Most lines are found in Hampden County with just over 8 miles of natural gas coming north to Northampton from Hampden County along I-91.

a) Natural Gas

A Tennessee Gas Pipeline Co. pipeline operated by Kinder Morgan, Inc. runs a pipeline along the region's southern edge. The system's 30-inch trunk lines originate in the southern Louisiana/Texas/Gulf of Mexico area, travels northeast through the country and region, divides in Hopkinton, Massachusetts, and terminates in Gloucester, Massachusetts, Providence, Rhode Island and Concord, New Hampshire. The main lines cut through ten area communities from Tolland in the west to Holland in the east. These mainlines are 24-inch and 30-inch diameter pipelines. A lateral line also runs north from Southwick to Northampton. This lateral is an 8- inch diameter

pipeline and becomes a 12-inch diameter pipeline north of Cook Road in Easthampton. This lateral serves Berkshire Gas, Holyoke Gas, Westfield Gas and Bay State Gas Companies. Additionally, a Tennessee Gas Pipeline Company line running north-south from Connecticut to Agawam meets a short line in Agawam operated by Eversource Gas of Massachusetts for a connection to the Berkshire Power plant in Agawam that serves New England ISO customers. Additionally, two lateral pipelines originate from a compressor station in Agawam, MA: a 10-inch lateral that feeds a 10-inch line toward an NGL Supplier in Agawam, MA and an 8-inch lateral that feeds the Berkshire Power plant located in Agawam, MA. Ownership of the plant includes Ares EIF Group and John Hancock. Massachusetts Wholesale Electric Company provides another inner-regional pipeline connection within the Springfield city limits.

b) Jet Fuel

Buckeye Pipeline Company is a common carrier of petroleum products within the states of Connecticut and Massachusetts. Buckeye Pipeline Company is a wholly owned subsidiary of Buckeye Partners, L.P. (NYSE: BPL). Buckeyes' local office is located in East Hartford, Connecticut, but management control is directed from Brenigsville, Pennsylvania. The Buckeye Pipeline Company system includes a trunk line of approximately 111 miles in length (beyond Hampden County). Of this, 93 miles are 12-inches in diameter, 7 miles are 10-inches in diameter, and 11 miles are 8-inches in diameter. There are also a number of spur lines for individual shippers that vary in length and diameter. Petroleum products enter the system at Buckeye Pipeline Company's New Haven Harbor receiving terminals. The trunk line terminates in Ludlow, Massachusetts. Delivery locations for the line in the Pioneer Valley include Springfield, Ludlow and the Westover Air Reserve Base in Chicopee.

c) Diesel and Gasoline

Diesel, gasoline and Jet fuel are provided through a north-south pipeline owned and operated by Buckeye Partners, LP. See the section on Jet fuel for a description of the line.

d) Abandoned Lines

Hampshire and Hampden Counties have roughly 37 miles of abandoned line that were used for a mix of liquid and gas. The longest line connected Springfield to a line that followed east/west on I-90. Another connected from Connecticut through East Longmeadow, Longmeadow and Wilbraham to the same I-90 line. Most of these lines were owned and operated by Mobil Pipeline Company, Inc.

e) Pipeline Awareness and Safety

Within the past 20 years there have been two incidents and 4 accidents involving pipelines within Hampden County. Each agency operating a pipeline in Hampden and Hampshire Counties provides contact details for education on pipeline safety and emergencies through a communications department or through a Pipeline Awareness Department. Contact details change. An updated list can be viewed by visiting the National Pipeline Mapping System: <https://www.npms.phmsa.dot.gov/>.

K. INTERNET INFRASTRUCTURE

The availability of reliable, high-speed internet service is important to enhance the connectivity and economic vitality of the Pioneer Valley region. The Massachusetts Broadband Institute (MBI) works to make affordable, highspeed internet available to all residents, businesses, schools, and other public entities in Massachusetts.

The Coronavirus Aid, Relief and Economic Security (CARES) Act provided a substantial investment in high-speed internet connectivity. This act also initiated the Emergency Broadband Benefit that provided a \$50 subsidy on internet services and a discount on a single purchase of either a computer or phone.

On May 9, 2022, the Biden Administration announced the creation of the Affordable Connectivity Program (ACP), as part of the Bipartisan Infrastructure Law (BIL) that provides direct subsidies to low-income and qualified individuals to purchase high speed internet at a substantially discounted rate.

1. Last Mile Program

On April 3, 2017, the Commonwealth and the Executive Office of Housing & Economic Development launched a new grant making program for unserved towns. The Last Mile Infrastructure Grant program provides funding for eligible towns for municipally owned broadband networks. MBI defines 9 unserved communities in the Pioneer Valley: Blandford, Chesterfield, Cumington, Goshen, Middlefield, Montgomery, Plainfield, Tolland and Worthington. The MBI supports broadband access projects that provide access to minimum speed requirements, demonstrate funding and financing plans, and achieve operating sustainability.

Figure A5-20 – Existing Pipelines in Hampden County

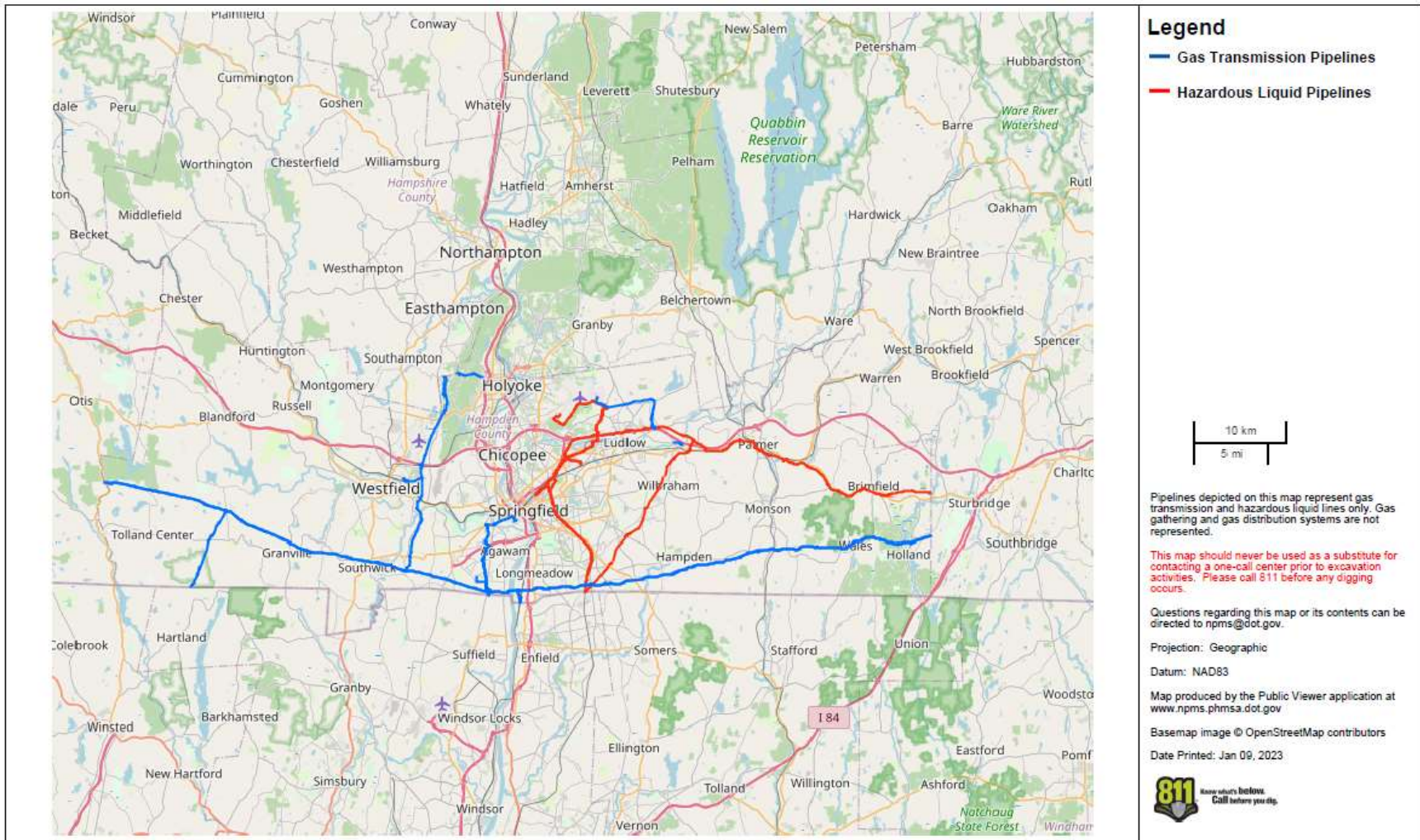
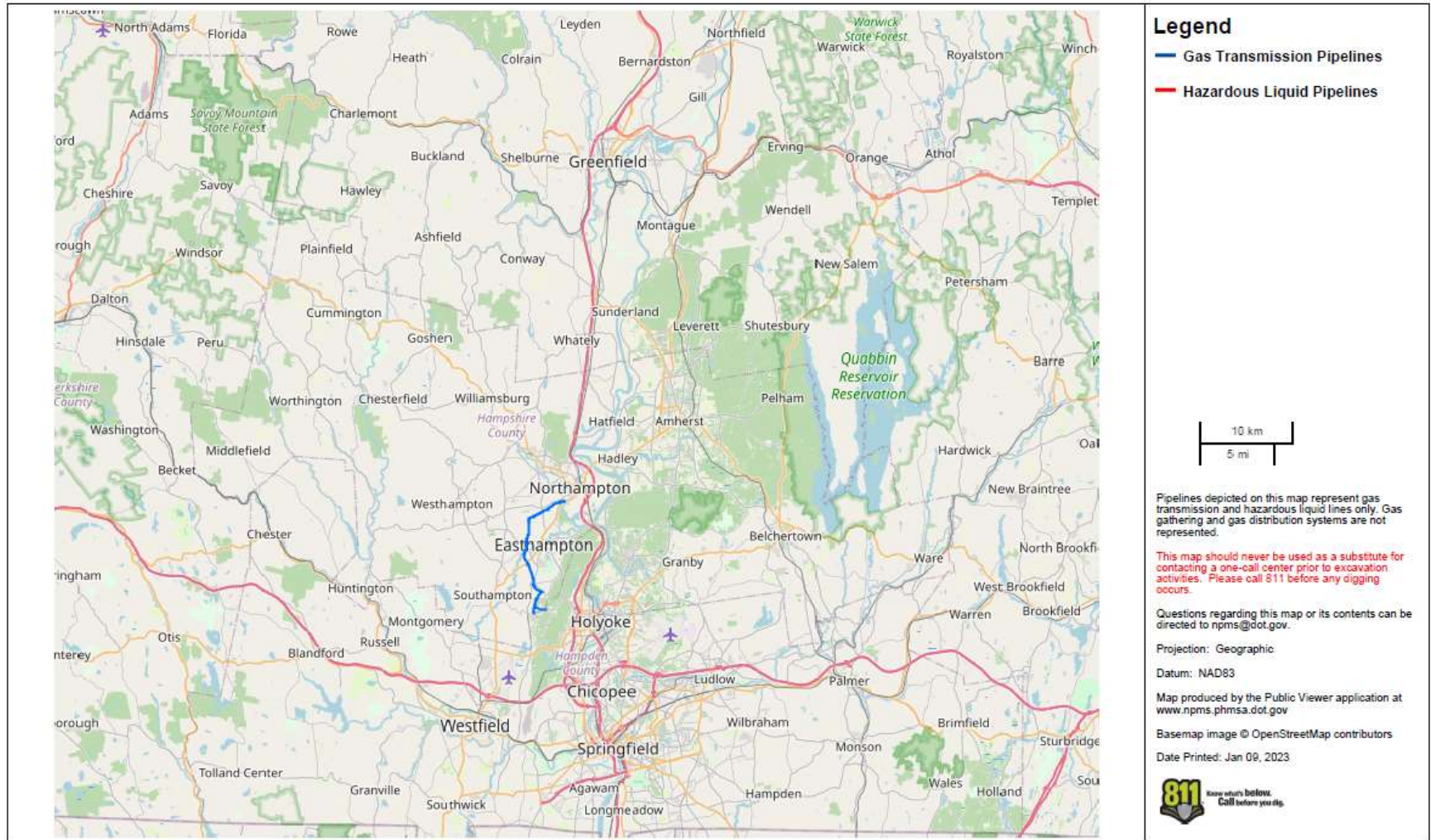


Figure A5-21 – Existing Pipelines in Hampshire County



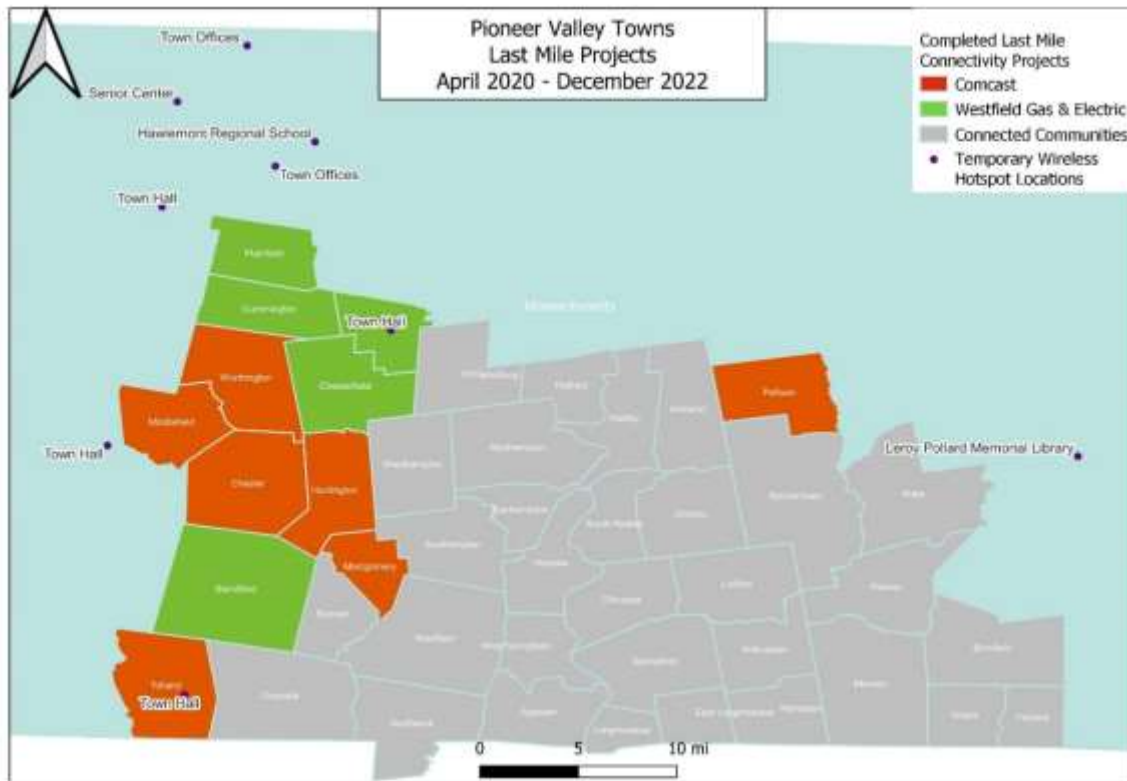
2. Middle Mile Program

Middle Mile describes the network infrastructure that connects local networks (last mile) to other service providers. MBI completed construction of an open-access, middle mile fiber-optic network in early 2014. The network consists of approximately 1,200 miles of fiber, connecting 123 communities in western and north central Massachusetts. The system is operated by LocalLinks (formerly KCST USA).

3. Other Developments and Interim Solutions

The Coronavirus Pandemic caused all aspects of the economy and government to reevaluate the necessity of high-speed internet. MBI and KCST USA initially rolled out wireless hotspots to 26 communities throughout Massachusetts with wireless broadband or fiberoptic hotspots to bridge the gaps in rural communities. Nine of those communities continued their hotspot until September or December 2022 or until the completion of a town-wide connectivity project. Tolland and Goshen, two towns in the Pioneer Valley, extended the program to September 2022. Last Mile Connectivity Projects have been completed at this time.

Figure A5-22 – Last Mile Connectivity Map

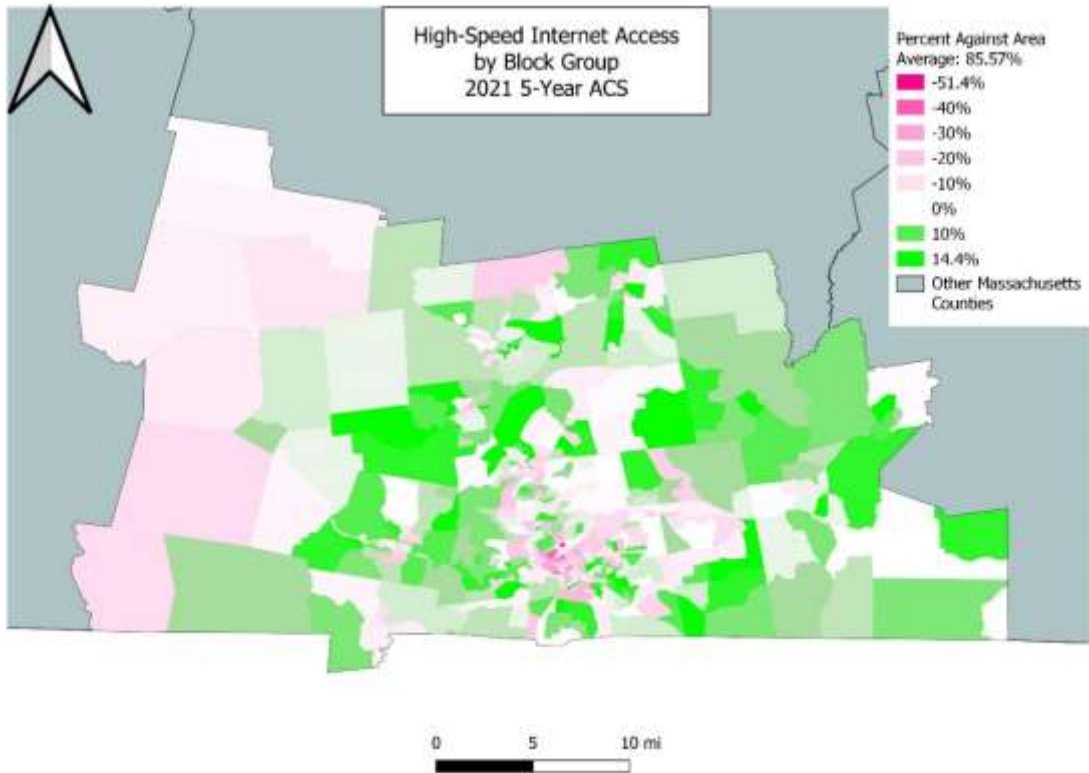


Source: Massachusetts Broadband Institute

4. Continued Gaps in Connectivity

While communities have access to a town-wide broadband network within the Pioneer Valley, there continue to be barriers to connectivity. The U.S. Census reports areas with a very high proportion of the population that lack high-speed internet. Some block groups in the City of Springfield are reported to have less than 50% of their population with connectivity to high-speed internet.

Figure A5-23 – Presence and Type of Internet Subscription Map



Source: 2021 5-Year ACS Table B28002

L. POPULATION

1. Trends

While the population in the Pioneer Valley region grew at a modest rate during the 1980s — increasing 3.62% to 602,878 residents in 1990 — population growth slowed to a trickle in the 1990s. Between 1990 and 2000, the region's population grew by 0.9 percent, reaching 608,479 persons. This is compared to a 5.5 percent increase for the Commonwealth of Massachusetts and a 13.2 percent increase for the nation. Between 2000 and 2010, the region's population grew by 3.6%. Population growth remained

steady until 2010 but slowed significantly between 2010 and 2020; only experiencing a net growth of 0.87%. The population of the Pioneer Valley region grew as a direct result of foreign immigration. Every year of the 1990s the region experienced a net loss in domestic migration (more people moved away to other parts of the country than moved into the region from other parts of the country). Despite the population growing in the early part of the 2000s, reaching an increase of 627, then accumulating another increase of 125 in 2009, almost 4,000 people had left by 2010, for an effective growth rate of 2.15%. Massachusetts growth rate for this same period was higher at 3.03%.

Table 5-24 shows the shift of population from urban areas to suburban and rural areas over the past 70 years. Suburbanization of the region became prominent in the 1950's when the communities adjacent to the urban core cities experienced unprecedented rates of growth. In the 1990's, with ongoing expansion, the highest rates of growth were found at the edges of the traditional suburbs, in the region's rural communities. Belchertown, for example, which has the largest land area of any community in the region had a population increase of 22.6 percent between 1990 and 2000.

Suburban growth has continued in the 2000s in towns like Belchertown and East Longmeadow, which grew by 14.9 percent and 14.6 percent respectively. More rural towns such as Goshen, Montgomery and Tolland have also seen significant population increases (21.4%, 22.3% and 55.6 %). Interestingly, since 2000 urban core communities have seen more modest growth; Springfield and Holyoke have seen increases of 1.7% and 1.3% respectively. Northampton's population has declined slightly. The population of Amherst, on the other hand, has grown by 14.4%. These trends have continued since 2000 with communities such as Montgomery, Brimfield, Southampton, and Granville experiencing sizable population change between 2000-2013 (up 22.3 percent, 11.5 percent, 13 percent, and 9.1 percent respectively).

Since the turn of the decade in 2010, population growth has slowed significantly on all fronts. No Pioneer Valley region municipalities express population growth greater than 10%. Major population centers such as Springfield have expressed minor growth of population 1.63%, while other regions such as Holyoke have experienced a direct decline in their population at - 4.30%. Since the onset of the Covid-19 pandemic in 2021, every municipality in the Pioneer Valley region has expressed a positive net growth; with the exceptions of Middlefield, Ware and Westhampton. These three towns have decreased by 1.04%, 1.15%, and 0.12% respectively.

Table A5-24 – Pioneer Valley Region Population Change

City/Town	1950	1960	1970	1980	1990	2000	2010	2017	2020	2021
Agawam	10166	15781	21717	26271	27323	28144	28438	28748	28641	28494
Amherst	10856	13781	26331	33229	35228	34873	37819	39880	39489	39378
Belchertown	4487	5186	5936	8339	10579	12968	14649	14906	15281	15279
Blandford	597	636	863	1038	1187	1214	1233	1259	1213	1210
Brimfield	1182	1414	1907	2317	3001	3339	3609	3724	3693	3690
Chester	1292	1155	1025	1123	1280	1306	1337	1529	1229	1221
Chesterfield	496	556	704	1000	1048	1201	1222	1303	1182	1178
Chicopee	49211	61553	66676	55112	56632	54653	55298	55778	55481	55190
Cummington	620	550	562	657	785	1004	872	860	824	819
East Longmeadow	4881	10294	13029	12905	13367	14100	15720	16156	16390	16370
Easthampton	10694	12326	13012	15580	15537	15994	16053	16051	16131	16022
Goshen	321	385	483	651	830	903	1054	1096	955	950
Granby	1816	4221	5473	5380	5565	6132	6240	6318	6086	6061
Granville	740	874	1008	1204	1403	1521	1566	1660	1538	1533
Hadley	2639	3099	3750	4125	4231	4793	5250	5301	5300	5272
Hampden	1322	2345	4572	4745	4709	5171	5139	5193	4955	4935
Hatfield	2179	2350	2825	3045	3184	3249	3279	3305	3327	3314
Holland	377	561	931	1589	2185	2407	2481	2510	2598	2583
Holyoke	54661	52689	50112	44678	43704	39838	39880	40362	38164	37929
Huntington	1256	1392	1593	1804	1987	2192	2180	1977	2086	2074
Longmeadow	6508	10565	15630	16301	15467	15633	15784	15876	15821	15725
Ludlow	8660	13805	17580	18150	18820	21209	21103	21331	20967	20900
Middlefield	295	315	288	385	392	580	521	464	384	388
Monson	6125	6712	7355	7315	7776	8359	8560	8803	8134	8098
Montgomery	157	333	446	637	759	656	838	802	815	812
Northampton	29603	30058	29664	29286	29289	28978	28549	28548	29473	29311
Palmer	9533	10358	11680	11389	12054	12497	12140	12237	12433	12372
Pelham	579	805	937	1112	1373	1403	1321	1277	1277	1267
Plainfield	228	237	287	425	571	576	648	668	629	628
Russell	1298	1366	1382	1570	1594	1655	1775	1330	1640	1635
South Hadley	10145	14956	17033	16399	16685	17196	17514	17737	18091	17995
Southampton	1387	2192	3069	4137	4478	5387	5792	6090	6197	6187
Southwick	2855	5139	6330	7382	7667	8835	9502	9711	9224	9196
Springfield	162399	174463	163905	152319	156983	152082	153060	154613	155556	154789
Tolland	107	101	172	235	289	428	485	666	468	465
Wales	497	659	852	1177	1566	1737	1838	2009	1829	1816
Ware	7517	7517	8187	8953	9808	9708	9872	9863	10062	10178
West Springfield	20438	24924	28461	27042	27537	27899	28391	28671	28793	28629
Westfield	20962	26302	31433	36465	38372	40072	41094	41667	40728	40575
Westhampton	452	583	793	1137	1327	1468	1607	1819	1612	1614
Wilbraham	4003	7387	11984	12053	12635	13473	14219	14553	14598	14551
Williamsburg	2056	2186	2342	2237	2515	2427	2482	2481	2490	2475
Worthington	462	597	712	932	1156	1219	1156	1253	1188	1182
Pioneer Valley Region	456059	532708	583031	581830	602878	608479	621570	630385	626972	624290
Massachusetts	4691000	5149000	5689170	5737037	6016425	6349097	6547629	6789319	7022220	6984723

Source: U.S. Census Bureau, UMass Donahue Institute State Data Center

Table A5-25 – Rate of Population Change by Community

County	1950 to 1960	1960 to 1970	1970 to 1980	1980 to 1990	1990 to 2000	2000 to 2010	2010 to 2020	2020 to 2021
Agawam	55.2%	37.6%	21.0%	4.0%	3.0%	2.1%	0.71%	-0.51%
Amherst	26.9%	91.1%	26.2%	6.0%	(1.0%)	14.4%	4.42%	-0.28%
Belchertown	15.6%	14.5%	40.5%	26.9%	22.6%	14.9%	4.31%	-0.01%
Blandford	6.5%	35.7%	20.3%	14.4%	2.3%	3.7%	-1.62%	-0.25%
Brimfield	19.6%	34.9%	21.5%	29.5%	11.3%	11.5%	2.33%	-0.08%
Chester	(10.6%)	(11.3%)	9.6%	14.0%	2.0%	17.1%	-8.08%	-0.65%
Chesterfield	12.1%	26.6%	42.0%	4.8%	14.6%	8.5%	-3.27%	-0.34%
Chicopee	25.1%	8.3%	(17.3%)	2.8%	(3.5%)	2.1%	0.33%	-0.52%
Cummington	(11.3%)	2.2%	16.9%	19.5%	27.9%	(14.3%)	-5.50%	-0.61%
East Longmeadow	110.9%	26.6%	(1.0%)	3.6%	5.5%	14.6%	4.26%	-0.12%
Easthampton	15.3%	5.6%	19.7%	(0.3%)	2.9%	0.4%	0.49%	-0.68%
Goshen	19.9%	25.5%	34.8%	27.5%	8.8%	21.4%	-9.39%	-0.52%
Granby	132.4%	29.7%	(1.7%)	3.4%	10.2%	3.0%	-2.47%	-0.41%
Granville	18.1%	15.3%	19.4%	16.5%	8.4%	9.1%	-1.79%	-0.33%
Hadley	17.4%	21.0%	10.0%	2.6%	13.3%	10.6%	0.95%	-0.53%
Hampden	77.4%	95.0%	3.8%	(0.8%)	9.8%	0.4%	-3.58%	-0.40%
Hatfield	7.8%	20.2%	7.8%	4.6%	2.0%	1.7%	1.46%	-0.39%
Holland	48.8%	66.0%	70.7%	37.5%	10.2%	4.3%	4.72%	-0.58%
Holyoke	(3.6%)	(4.9%)	(10.8%)	(2.2%)	(8.8%)	1.3%	-4.30%	-0.62%
Huntington	10.8%	14.4%	13.2%	10.1%	10.3%	(9.8%)	-4.31%	-0.58%
Longmeadow	62.3%	47.9%	4.3%	(5.1%)	1.1%	1.6%	0.23%	-0.61%
Ludlow	59.4%	27.3%	3.2%	3.7%	12.7%	0.6%	-0.64%	-0.32%
Middlefield	6.8%	(8.6%)	33.7%	1.8%	48.0%	(20.0%)	-26.30%	1.04%
Monson	9.6%	9.6%	(0.5%)	6.3%	7.5%	5.3%	-4.98%	-0.44%
Montgomery	112.1%	33.9%	42.8%	19.2%	(13.6%)	22.3%	-2.74%	-0.37%
Northampton	1.5%	(1.3%)	(1.3%)	0.0%	(1.1%)	(1.5%)	3.24%	-0.55%
Palmer	8.7%	12.8%	(2.5%)	5.8%	3.7%	(2.1%)	2.41%	-0.49%
Pelham	39.0%	16.4%	18.7%	23.5%	2.2%	(9.0%)	-3.33%	-0.78%
Plainfield	3.9%	21.1%	48.1%	34.4%	0.9%	16.0%	-2.93%	-0.16%
Russell	5.2%	1.2%	13.6%	1.5%	3.8%	(19.6%)	-7.61%	-0.30%
South Hadley	47.4%	13.9%	(3.7%)	1.7%	3.1%	3.1%	3.29%	-0.53%
Southampton	58.0%	40.0%	34.8%	8.2%	20.3%	13.0%	6.99%	-0.16%
Southwick	80.0%	23.2%	16.6%	3.9%	15.2%	9.9%	-2.93%	-0.30%
Springfield	7.4%	(6.1%)	(7.1%)	3.1%	(3.1%)	1.7%	1.63%	-0.49%
Tolland	(5.6%)	70.3%	36.6%	23.0%	48.1%	55.6%	-3.51%	-0.64%
Wales	32.6%	29.3%	38.1%	33.1%	10.9%	15.7%	-0.49%	-0.71%
Ware	0.0%	8.9%	9.4%	9.5%	(1.0%)	1.6%	1.92%	1.15%
West Springfield	21.9%	14.2%	(5.0%)	1.8%	1.3%	2.8%	1.42%	-0.57%
Westfield	25.5%	19.5%	16.0%	5.2%	4.4%	4.0%	-0.89%	-0.38%
Westhampton	29.0%	36.0%	43.4%	16.7%	10.6%	23.9%	0.31%	0.12%
Wilbraham	84.5%	62.2%	0.6%	4.8%	6.6%	8.0%	2.67%	-0.32%
Williamsburg	6.3%	7.1%	(4.5%)	12.4%	(3.5%)	2.2%	0.32%	-0.60%
Worthington	29.2%	19.3%	30.9%	24.0%	5.4%	2.8%	2.77%	-0.51%
Pioneer Valley Region	16.8%	9.4%	(0.2%)	3.6%	0.9%	3.6%	0.87%	-0.43%
Massachusetts	9.8%	10.5%	0.8%	4.9%	5.5%	6.9%	7.25%	-0.53%

Source: U.S. Census Bureau, UMass Donahue Institute State Data Center

2. Ethnic and Racial Diversity

The Pioneer Valley region's ethnic and racial diversity continues to grow. Continuing an established trend, the region's Hispanic and Latino population grew by 62.5% between 2000 and 2017, a rate of growth that was significant, though slightly lower than that of the state and slightly higher than the national rate. While the rate of growth in the Hispanic and Latino population has been slightly slower than that of the state, at approximately 19.2% of the total population, the Hispanic and Latino population is slightly higher than that of the nation. In this sense, the Pioneer Valley region looks less like the rest of the state as a whole and more like nation-wide demographics.

While the proportion of people who identify as White (of any ethnicity) in the Pioneer Valley region is now just over 80%, slightly higher than that of Massachusetts as a whole, the breakdown of people who identified as races other than White was varied somewhat.

The Pioneer Valley region was nearly identical to the state in the proportion of people who identify as African Americans (7.25% vs. 7.4%), Native Americans or Pacific Islander (0.2%), about 3% lower in the proportion of people who identify as an Asian race (3.0%) and .3% higher in the proportion of people who consider themselves a race other than the main five classifications recognized by the U.S. Census Bureau (4.4% of the region's population identify this way).

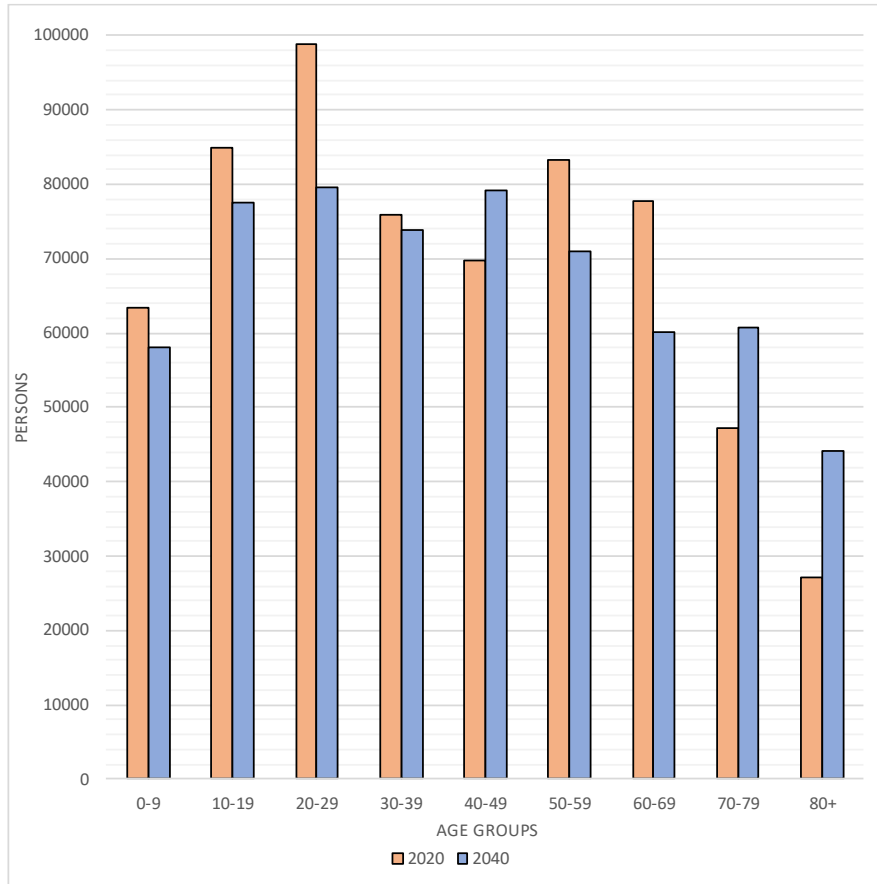
The region's populations who identify as other than white and non-Hispanic continue to be concentrated in either the urban core area or its surrounding communities. With the region's population increase attributed primarily to growth in minority groups, it can be inferred that the bulk of new residents are located in or around the Springfield-Chicopee-Holyoke urbanized area. Given that the core cities diminished in population, this implies a significant out-migration of white people from the urban core. In addition, the average annual income for persons of color is, generally, less than that for white persons. Combined, these factors indicate that the region's urban area may experience an increase in demand for transit service.

3. Age

Reflecting a national trend, the Pioneer Valley region's population is aging. In 1990, the region's median age was 32.8, had risen to 35.9 in 2000, and reached 38 in 2017. This trend is projected to continue for the next several decades because fertility rates are low, and the baby boomer generation are becoming seniors. Figure 5-24 shows the actual 2020 population and the projected 2040 population by age group. All three age groups over age 60 show increases in population between 2020 and 2040.

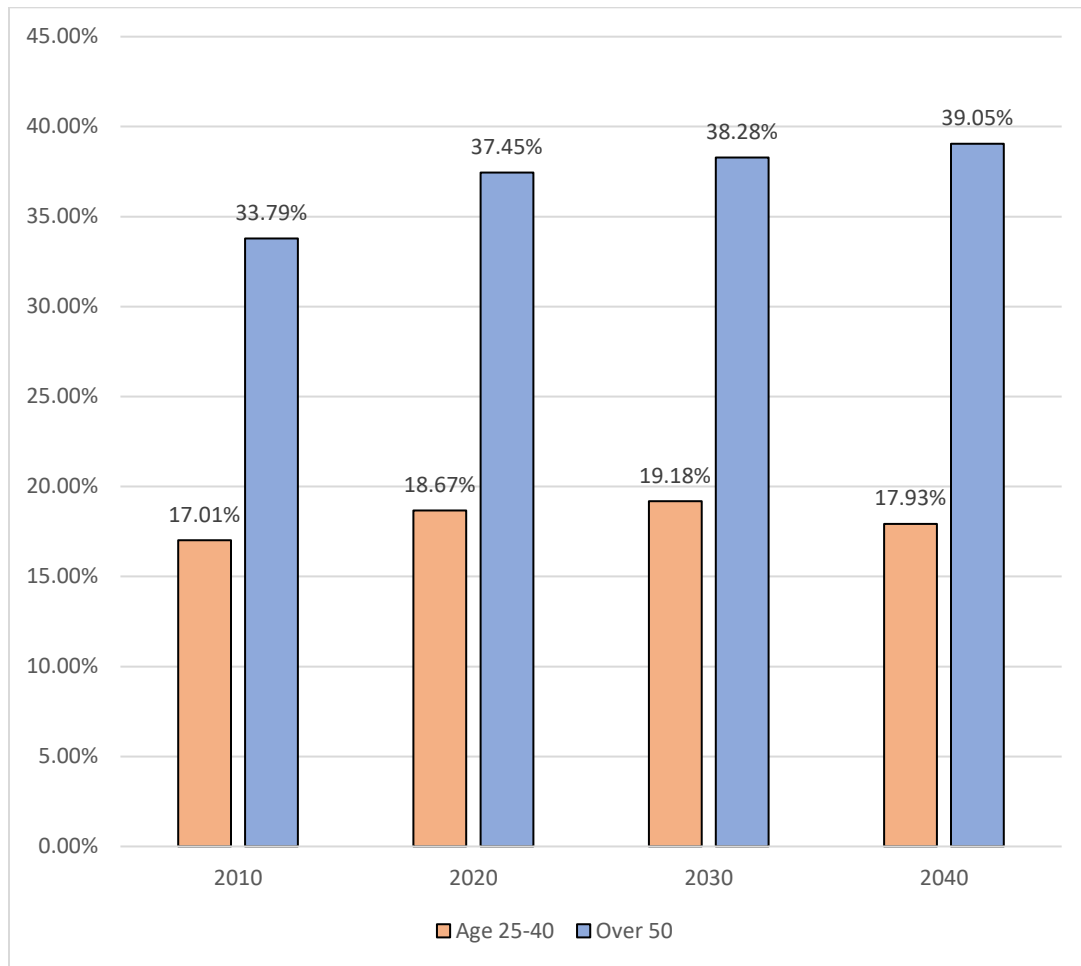
Decreases in the size of the region's young adult population are also expected to continue. Figure 5-25 contrasts the change in the elder population with that of the 20-to-39-year-old population.

Figure A5-24 – Projected Regional Population by Age Group



Source: UMass Donahue Institute, MA State Data Center, 2021 Projections

Figure A5-25 – Projected Percent of the Population in select Age Groups



Source: UMass Donahue Institute, MA State Data Center

M. HOUSING

1. Household Growth

Despite the modest population growth of 2010 to 2020, the number of households present in the Pioneer Valley region still increased from 236,337 to 240,099. As of 2021, the total household population stands at 244,212. That's represented by a 1.6% increase from 2010 to 2020, but a 1.7% from 2020 to 2021. Montgomery experienced the largest percentage increase in households in the last decade, with a growth of 25.4%. Pioneer Valley's urban core is experiencing a substantive shift, with Springfield only experiencing a total growth of 1.0% between 2010 and 2020, while Holyoke experienced a decrease of 4.0%.

Table A5-26 – Total Households, 1990-2021

	Total Households					Percent Change			
	1990	2000	2010	2020	2021	1990 to 2000	2000 to 2010	2010 to 2020	2020 to 2021
Agawam	10,382	11,271	11,543	11,668	11,785	8.6%	2.4%	1.1%	1.0%
Amherst	8,472	9,150	9,105	9,488	9,328	8.0%	-0.5%	4.2%	-1.7%
Belchertown	3,791	4,904	5,442	5,667	5,888	29.4%	11.0%	4.1%	3.9%
Blandford	423	460	457	443	473	8.7%	-0.7%	-3.1%	6.8%
Brimfield	1,104	1,252	1,323	1,494	1,503	13.4%	5.7%	12.9%	0.6%
Chester	467	490	538	539	517	4.9%	9.8%	0.2%	-4.1%
Chesterfield	357	446	453	513	460	24.9%	1.6%	13.2%	-10.3%
Chicopee	22,536	23,115	22,863	23,447	23,852	2.6%	-1.1%	2.6%	1.7%
Cummington	322	406	414	431	408	26.1%	2.0%	4.1%	-5.3%
East Longmeadow	4,655	5,236	5,677	5,762	6,011	12.5%	8.4%	1.5%	4.3%
Easthampton	6,160	6,859	7,233	7,511	7,796	11.3%	5.5%	3.8%	3.8%
Goshen	317	368	428	374	372	16.1%	16.3%	-12.6%	-0.5%
Granby	1,932	2,259	2,578	2,584	2,530	16.9%	14.1%	0.2%	-2.1%
Granville	480	542	578	644	657	12.9%	6.6%	11.4%	2.0%
Hadley	1,624	1,895	1,977	2,256	2,254	16.7%	4.3%	14.1%	-0.1%
Hampden	1,636	1,823	1,937	2,025	2,016	11.4%	6.3%	4.5%	-0.4%
Hatfield	1,258	1,378	1,531	1,419	1,490	9.5%	11.1%	-7.3%	5.0%
Holland	795	900	1,059	1,041	1,106	13.2%	17.7%	-1.7%	6.2%
Holyoke	15,871	15,000	16,108	15,464	15,062	-5.5%	7.4%	-4.0%	-2.6%
Huntington	718	813	870	900	911	13.2%	7.0%	3.4%	1.2%
Longmeadow	5,333	5,738	5,590	5,723	5,821	7.6%	-2.6%	2.4%	1.7%
Ludlow	6,870	7,666	7,753	8,310	8,567	11.6%	1.1%	7.2%	3.1%
Middlefield	135	219	176	170	164	62.2%	-19.6%	-3.4%	-3.5%
Monson	2,633	3,099	3,123	3,559	3,422	17.7%	0.8%	14.0%	-3.8%
Montgomery	258	257	291	365	366	-0.4%	13.2%	25.4%	0.3%
Northampton	11,151	11,863	11,783	11,352	11,949	6.4%	-0.7%	-3.7%	5.3%
Palmer	4,747	5,090	5,189	4,904	5,207	7.2%	1.9%	-5.5%	6.2%
Pelham	487	537	542	589	543	10.3%	0.9%	8.7%	-7.8%
Plainfield	217	247	259	289	281	13.8%	4.9%	11.6%	-2.8%
Russell	557	598	636	607	555	7.4%	6.4%	-4.6%	-8.6%
South Hadley	5,865	6,584	6,983	6,993	7,328	12.3%	6.1%	0.1%	4.8%
Southampton	1,541	1,966	2,226	2,336	2,318	27.6%	13.2%	4.9%	-0.8%
Southwick	2,725	3,312	3,737	3,869	3,648	21.5%	12.8%	3.5%	-5.7%
Springfield	57,570	57,178	56,229	56,804	58,344	-0.7%	-1.7%	1.0%	2.7%
Tolland	106	183	198	216	193	72.6%	8.2%	9.1%	-10.6%
Wales	548	660	774	839	813	20.4%	17.3%	8.4%	-3.1%
Ware	3,794	4,020	4,352	4,289	4,557	6.0%	8.3%	-1.4%	6.2%
West Springfield	11,461	11,866	11,761	12,402	12,734	3.5%	-0.9%	5.5%	2.7%
Westfield	13,812	14,798	15,270	15,099	15,292	7.1%	3.2%	-1.1%	1.3%
Westhampton	438	539	608	669	645	23.1%	12.8%	10.0%	-3.6%
Wilbraham	4,521	4,941	5,091	5,268	5,365	9.3%	3.0%	3.5%	1.8%
Williamsburg	912	1,031	1,124	1,198	1,168	13.0%	9.0%	6.6%	-2.5%
Worthington	415	471	528	579	513	13.5%	12.1%	9.7%	-11.4%
Pioneer Valley Region	219,396	231,430	236,337	240,099	244,212	5.5%	2.1%	1.6%	1.7%

Source: U.S. Census Bureau, ACS 5-Year Estimate

2. Size

The number of households overall has increased between the years 2010 and 2021. While the number of people within a household has remained mostly consistent, 2 person homes are becoming the most prominent accounting for 34.6% of households (See Table 5-27). Household size has been decreasing throughout the nation over the past fifty years. In 1970, 47 percent of households had one or two people, by 2021 this number increased to 54 percent of all households. Large households (4 or more people) decreased from 35.46% percent of all households in 1970 to 19.64% percent of all households in 2021.

The trend toward more and smaller households (particularly single person households), and increased development in the region's rural areas, indicates increases in the total number of commuters as well as those inclined to commute alone, the number of vehicles, and the number of vehicle miles traveled. Table 5-28 shows the number of households in each community by type (family vs. non-family).

Another important factor in housing size is the number of dwelling units per household. The communities of the region represent a wide range of situations. In the urban areas, such as Springfield and Holyoke, there is a high density of multi-family dwellings, while some rural and suburban communities are almost exclusively single-family homes. Of the total housing units in the region, 156,753, or 61%, are single-family and 93,606, or 37.7% are multi-family. The communities of Amherst and Northampton are an exception to the pattern described above. These communities have high college student populations which results in a disproportionate concentration of multi-family homes.

Table A5-27 – Household Size, 1960 to 2021

Year	Number of Households				Total
	1 Person	2 People	3 People	4+ People	
1960	21425	42454	31047	61944	156,870
	13.66%	27.06%	19.79%	39.49%	
1970	32998	50799	31071	63114	177,982
	18.54%	28.54%	17.46%	35.46%	
1980	47036	62661	35616	56967	202,280
	23.25%	30.98%	17.61%	28.16%	
1990	55863	68760	39324	56011	219,958
	25.40%	31.26%	17.88%	25.46%	
2000	65759	73290	37960	54421	231,430
	28.41%	31.67%	16.40%	23.52%	
2010	71605	76223	36954	51555	236,337
	30.30%	32.25%	15.64%	21.81%	
2021	72842	84974	39394	48204	245,414
	29.68%	34.62%	16.05%	19.64%	

Source: US Census Bureau, ACS 1-Year Estimate

N. EMPLOYMENT

1. Type

The region's economic base continues to demonstrate the transition from manufacturing to the service industry. Manufacturing once dominated the Valley's economy, employing over 28 percent of the work force in 1980. By 1990, nearly one-quarter of those manufacturing jobs had been lost or relocated out of the Region. This trend continued into the 1990s as the number of manufacturing jobs decreased by 25.3 percent between 1990 and 2000. Table 5-29 shows employment in the region's communities by employment sector, total payroll, and average wage for 2021. At \$ \$60,996 Springfield has one of the highest average annual wages within the region because it is home to many of the region's largest and most successful employers.

Table A5-28 – Number of Households by Type and Size, 2021

Town	Family Households	Nonfamily Households
Agawam	7,360	4,308
Amherst Town	4,648	4,840
Belchertown	4,138	1,529
Blandford	301	142
Brimfield	1,032	462
Chester	404	135
Chesterfield	341	172
Chicopee	14,048	9,399
Cummington	225	206
East Longmeadow	4,102	1,660
Easthampton	4,234	3,277
Goshen town	249	125
Granby	1,937	647
Granville	462	182
Hadley	1,430	826
Hampden	1,484	541
Hatfield	870	549
Holland	661	380
Holyoke	9,288	6,176
Huntington	587	313
Longmeadow	4,252	1,471
Ludlow	5,916	2,394
Middlefield	112	58
Monson	2,465	1,094
Montgomery	267	98
Northampton	6,170	5,182
Palmer	3,030	1,874
Pelham	329	260
Plainfield	185	104
Russell	454	153
South Hadley	4,170	2,823
Southampton	1,817	519
Southwick	2,792	1,077
Springfield	35,262	21,542
Tolland	143	73
Wales	568	271
Ware	2,792	1,497
West Springfield	6,798	5,604
Westfield	10,255	4,844
Westhampton	523	146
Wilbraham	3,925	1,343
Williamsburg	723	475
Worthington	350	229

Source: US Census Bureau

Several important implications for transportation can be derived from this information. First, the shift from primarily manufacturing jobs to high paying service jobs means that during that period the average annual income for many of the region's residents was increasing. This, in turn, has improved residential flexibility and choice for residents. Since the cost of housing in urban areas is typically less than that for suburbs or outlying areas, residents with increased incomes can afford to live outside the urban core and commute. This was clearly shown in Census 2000 data as population decreases in the urban core are accompanied by increases in outlying suburbs and rural towns. The trend is beginning to reverse, as higher gasoline prices and the 2008-09 recession encouraged workers to live closer to employment centers by the 2010 Census.

Finally, increases in the number of two-income households and the number of women in the work force indicate increases in the number of vehicles and vehicle miles traveled. Often the workers in a two-income household are unable to share a commute due to the distance or time inconveniences. Therefore, the number of vehicles and miles traveled increases. In addition to more trips to and from work, the number of incidental or side trips also increases (particularly during rush hour) as children are taken to and from day care facilities and errands are combined with the commute. Due to the need to access childcare, retail and business facilities during the workday, the single occupant vehicle remains the primary choice for transportation of the region's work force. Employer-based childcare facilities could enhance the opportunity for many people to use an alternative to the single occupant vehicle. Likewise, the provision of retail and business establishments near employment centers (such as drug stores, banks, restaurants) could reduce the need for all employees to have cars in order to take care of personal business during the workday.

2. Growth

As Figure 5-26 illustrates, the early 1990s saw sharp decreases in employment levels across the Pioneer Valley region, largely the result of economic recession. Consequently, people began leaving the region, provoking a steep drop in the size of the region's labor force between 1990 and 1996. This had potential to be disastrous for growth in the region as employers grew frustrated at the lack of qualified workers to fill open positions. However, declines in employment and labor force size leveled off in the second half of the 1990s and, beginning in 2000, both measures appeared to be sharply increasing. About a year after the March 2001 recession, employment levels in the Pioneer Valley began to fall again, and then more extremely during the 2008-2009 recession. Neither employment

levels nor the labor force have recovered fully from the recession, though they do seem to be headed in the right direction: between 2010 and 2021, both employment and labor forces grew, while the unemployment rate correspondingly declined. This all changed with the advent of the COVID-19 pandemic in March of 2020, which caused a spike in unemployment up to 10% in the Pioneer Valley Region while employment opportunities and the available labor force significantly dropped. As of 2021, unemployment sits at approximately 7%.

The recession of 2008-09 resulted in a net decrease in employment between 2000 and 2010. Sectors that managed to grow included state and local government (8.9 percent), education (31.8 percent) and health care (29 percent). Projected growth will likely take place in the health care, education and construction industries as the economy recovers (BLS, Employment Projections, Table 2. Employment by Major Industry Sector, 2012 - national) [Manufacturing employment will most likely continue to decrease, though perhaps not as quickly as it has in the last two decades.]

3. Median Household Income

Between 2010 to 2021, the median household income has recovered significantly. While Hampshire County and the Pioneer Valley region experienced percentage changes exceeding the fiscal decline from the 2008 recession, Hampden County has yet to entirely recover. As of 2021, Hampden County has yet to exceed the median household income that existed prior to 2000.

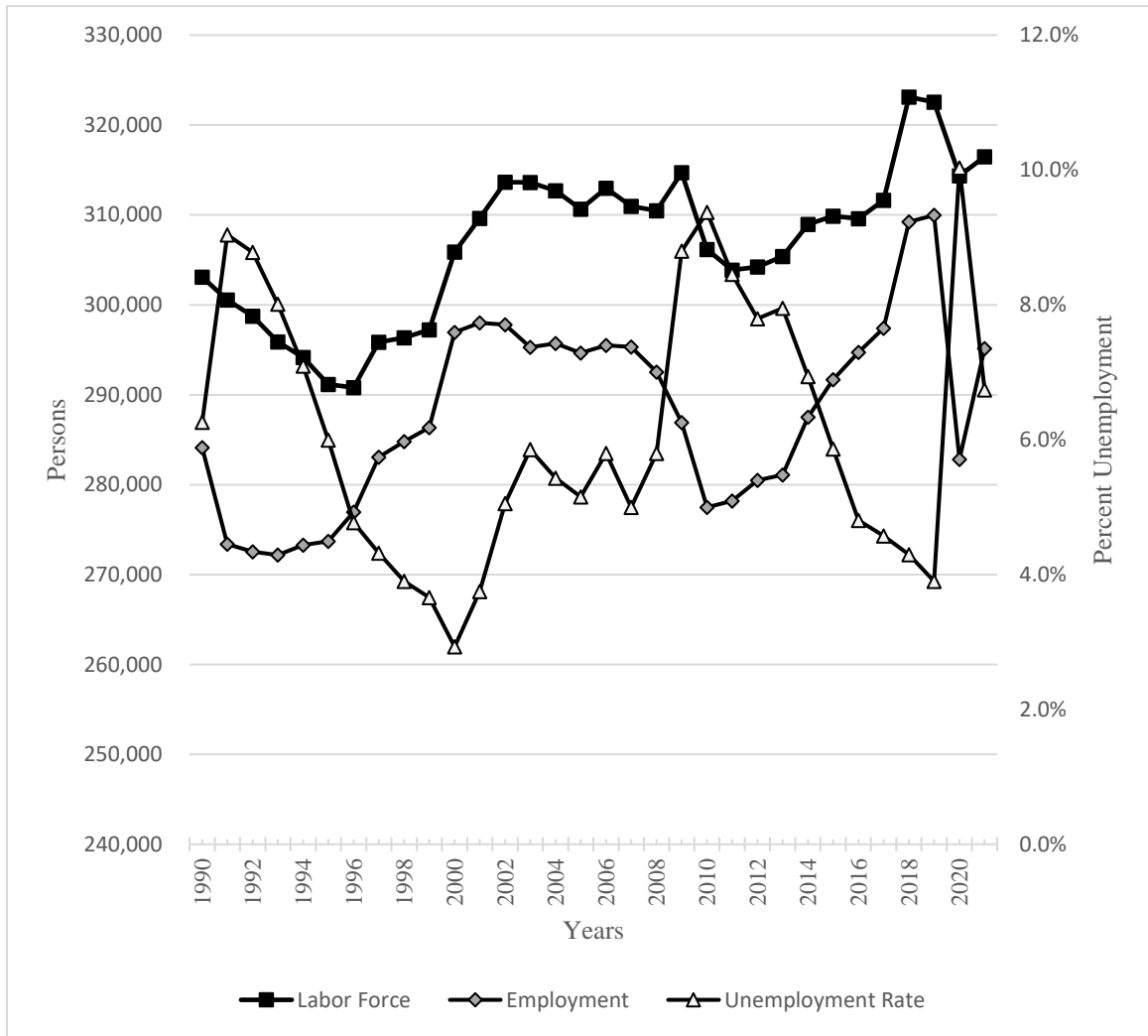
Though median household income has declined, per capita income (see Figure 5-27) in the Pioneer Valley region, except for slight losses between 1989 and 1993, had been increasing steadily since 1980. Despite two recessions in the 2000s, per capita wages continue to increase. Overall, declining household income coupled with rising average wages and per capita income is likely indicating that there are fewer wage earners per household now than in the past. This conclusion is also supported by our finding of shrinking average household sizes.

Table A5-29 – Pioneer Valley Regional Employment by Industrial Sector, 2021

City/Town	Admin. & Waste Services	Agricul. Forestry, Fish. & Hunting	Arts, Entertain. & Rec.	Constr.	Educ. Services	Finance and Insurance	Health Care and Social	Inf.	Manage. of Comp. and Ent.	Manu.	Other Services	Prof. and Tech. Services	Public Admin.	Real Estate and Leasing	Retail Trade	Transp. and Ware.	Utilities	Whole. Trade	No. of Estab.	Emp.	Yearly Wage	Weekly Wage
Agawam	842		985	1142		207	1415	102	24	3986	384	792		116	831	336	584	891	970	11255	59800	1150
Amherst	168	68	211	342	18554	169	1875	388			445	590	936	139	720	92		43	906	15122	61568	1184
Belchertown	126	15		394		48	484			146	67	212	378	29	280	244		187	352	2736	47580	915
Blandford				26			4												28	156	32084	617
Brimfield	30			198		12	25	20			17	26		16	24	31			117	596	54912	1056
Chester							7												22	95	35152	676
Chesterfield				96			21												23	179	32708	629
Chicopee	437		111	2800	3776	453	2798	664	348	6110	437	494	2274	140	2597	1082		1247	1910	19458	51220	985
Cummington	7														36	8			36	257	46072	886
E. Longmeadow	242		171	574	1380	208	1704	108		3492	341	748		70	774	212		314	659	7853	52312	1006
Easthampton	165		33	692	1452	198	712	78		1338	216	422		50	688		66	38	537	4981	47008	904
Goshen				38															33	161	42224	812
Granby	72			280	426		101	22			32	100			92			53	158	1007	44512	856
Granville	14			20			12				9					7			44	149	34580	665
Hadley	221	244	106	472	1708	136	361	146		86	186	340	544	26	1950	26		44	380	5890	44564	857
Hampden	103			220		13	163			36	12	64			62	16			150	1058	44200	850
Hatfield	78	31		228			142	146		146	35	160			73	71		980	137	1973	55536	1068
Holland				24			15					6			11	16			39	223	30108	579
Holyoke	661	241	240	1228	4670	443	7638	136	783	2946	481	692	1626	331	2698	341	1546	263	2362	21357	53404	1027
Huntington				46			101								20				45	399	42276	813
Longmeadow	165		229	174	2288	170	1377	78			64	178		55	416	24		102	420	4291	58760	1130
Ludlow	336		68	1494		163	858	32		1258	172	340		64	580	86		176	567	6571	54964	1057
Middleborough	453	40	64	1426	1382	113	1244		1599	1832	508	352	758	29	985	560		360	699	8841	58552	1126
Monson	63		22	314			166			282	42	70			237	61		40	212	1493	49868	959
Montgomery				24								6							11	40	33592	646
Northampton	308		209	1356	6260	388	6127	606		2170	684	1614	2110	97	2156	155	56		1342	20180	63492	1221
Palmer	220		33	804	732	44	922	126	417	1388	119	234	454	47	442	100		114	447	4466	50440	970
Pelham				20			9					60							38	158	41340	795
Plainfield							10				56								26	118	31096	598
Russell				18			5								24				30	144	48776	938
South Hadley	212		46	678	3108	97	545	42		564	159	176	346	34	369	173		86	433	4734	51896	998
Southampton	15		30	388			72				38	104		11	246	20		14	147	1156	45396	873
Southwick	123	112	100	324		55	189	34		714	95	60		23	430	51		30	306	2615	45500	875
Springfield	2747	17	656	3506	15828	4743	30552	2080	4479	7796	2393	4452	7120	736	4996	3559	970	1527	8200	79545	60996	1173
Tolland																			6	33	26832	516
Wales				20			17					16				7			52	184	33228	639
Ware	113		8	154		55	309	32		558	44	100			830	40			292	2571	48308	929
W. Springfield	1465		403	1490	1950	303	2949	382		2002	493	570		411	3059	1015	30	728	1396	16411	49400	950
Westfield	398	24	244	1918	3730	199	2748	286		5528	590	1672	1964	92	1901	1833		565	1295	17477	55068	1059
Westhampton	16			58	384		21				12				37				53	344	48464	932
Wilbraham			107	384	1498	82	754	36		720	149	294		44	628			60	440	5503	41600	800
Williamsburg	13		2	200			17	8		130	19	76			83	20		6	100	554	40768	784
Worthington				20			58												35	171	34580	665

Source: Mass.gov, Department of Economic Research

Figure A5-26 – Pioneer Valley Region Labor Force, Employment, and Unemployment Trends



Source: Department of Economic Research, Mass.Gov

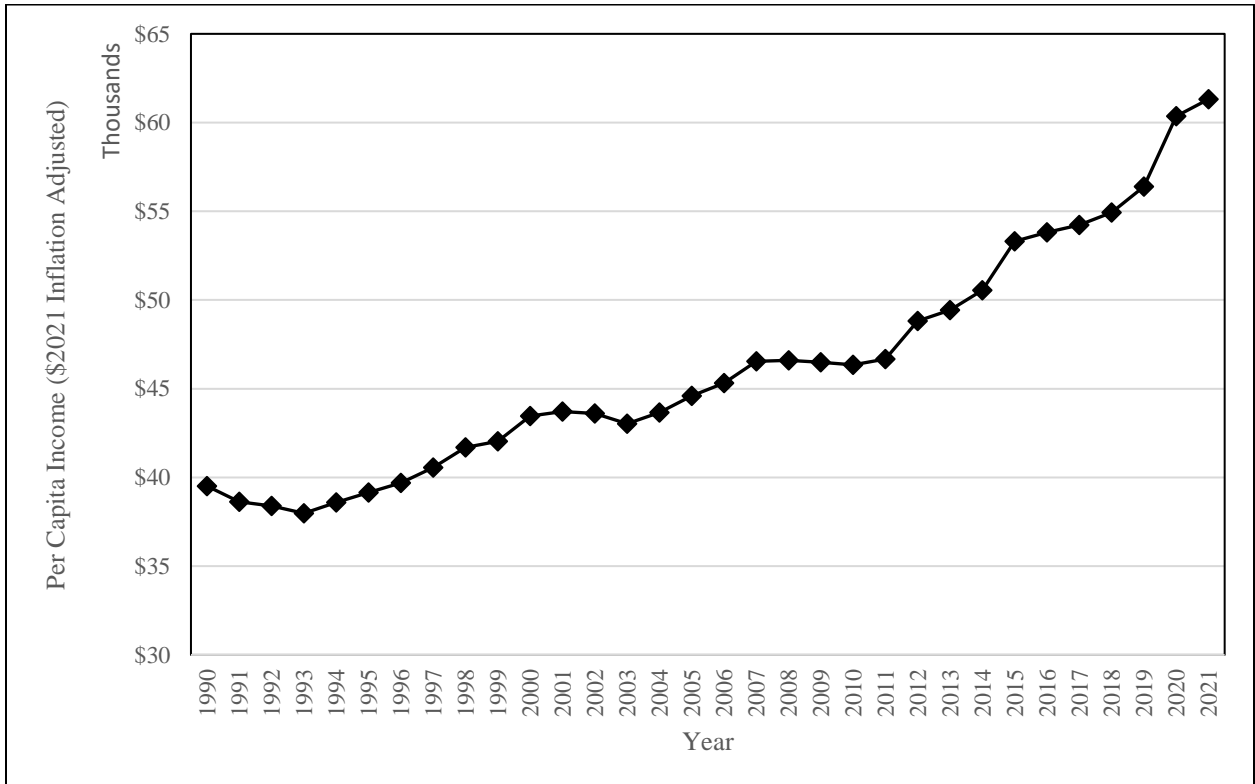
Table A5-30 – Median Household Income

Region	Median Household Income (2021 Dollars Adjusted)			Percent Change	
	2000	2010	2021	2000 to 2010	2020 to 2021
Hampden County	\$62,778	\$56,315	\$61,747	-10.29%	9.64%
Hampshire County	\$72,862	\$71,124	\$77,495	-2.38%	8.96%
Pioneer Valley Region*	\$65,216	\$59,887	\$65,653	-8.17%	9.63%

Source: U.S. Census Bureau, ACS 1-year Estimates

*Median household income for the region is a weighted average of county data based on the number of households.

Figure A5-27 – Per Capita Income, 1990-2021



Source: US Bureau of Economic Analysis

O. VEHICLE REGISTRATION AND OWNERSHIP

Based on information available from 2015, a total of 489,999 vehicles were registered in the Pioneer Valley region. This translates into approximately 0.78 vehicles per person and is a decrease of 4.9 percent from 2000. Most of this decrease can be attributed to significantly fewer registered automobiles. Between 2000 and 2015, automobile registrations dropped by over 23 percent. Automobile registrations appear to have peaked in 2008, at 304,425. Despite record-high gasoline prices between 2008-2012, light trucks and SUVs continue to comprise over one-third of registered vehicles.

This decrease in automobile ownership is notable. The decrease in car ownership may be a result of the reduced workforce, and families not needing a second car. Alternatively, car owners may opt to use public transit to reduce transportation expenses and avoid car maintenance costs altogether.

The City of Springfield has the most registered vehicles with 90,493 recorded in 2015. This translates to 18.5 percent of registered vehicles in the region. Outlying communities—including Belchertown, Brimfield, Chesterfield, Goshen, Holland, Plainfield, Tolland and Westhampton—had the largest increase in registered vehicles between 2000 and 2015. However, in the light truck and SUV category, the region's wealthiest town, Longmeadow, had the largest increase in registrations at 58.1 percent followed closely by East Longmeadow at 57.7%. Tables 5-31 and 5-32 summarize the number of registered motor vehicles in the Pioneer Valley by community and type of vehicle for 2000 and 2015. Table 5-33 highlights the percent change in registrations between 2000 and 2015 by type of vehicle and community.

For the most current vehicle registration information, please visit the Massachusetts Vehicle Census: <https://geodot-homepage-massdot.hub.arcgis.com/pages/massvehiclecensus>

Table A5-31 – Registered Motor Vehicles in the Pioneer Valley – 2000

	Automobiles	Trailers	Light Trucks/SUVs	Heavy Trucks	Motorcycles	Other	Total
Agawam	16,485	1,611	6,836	659	362	237	27,953
Amherst	12,378	508	3,294	151	168	242	18,331
Belchertown	6,599	948	3,769	201	261	191	12,650
Blandford	627	128	485	19	36	15	1,369
Brimfield	1,763	322	1,198	94	99	75	3,719
Chester	646	116	576	31	48	19	1,483
Chesterfield	525	95	507	26	34	23	1,253
Chicopee	30,092	2,210	10,480	878	653	460	47,050
Cummington	523	76	367	22	26	31	1,101
East Longmeadow	8,452	806	3,495	258	187	216	14,439
Easthampton	8,944	675	3,851	165	291	191	14,819
Goshen	467	97	352	29	27	14	1,034
Granby	3,189	573	1,999	117	131	98	6,407
Granville	806	160	624	71	56	26	1,840
Hadley	2,768	357	1,435	124	53	76	5,110
Hampden	2,816	455	1,584	123	99	69	5,530
Hatfield	1,984	444	1,120	236	52	70	4,161
Holland	1,249	180	825	22	70	25	2,469
Holyoke	18,562	751	5,438	280	325	290	26,992
Huntington	1,034	165	805	48	58	39	2,212
Longmeadow	9,600	368	2,929	44	103	70	15,205
Ludlow	10,771	1,104	4,984	430	306	182	18,809
Middlefield	236	45	229	11	22	14	578
Monson	4,095	714	2,799	206	217	119	8,520
Montgomery	380	100	345	19	21	13	917
Northampton	15,629	882	5,282	340	335	261	24,541
Palmer	6,751	837	3,485	307	274	168	12,314
Pelham	785	99	359	24	17	24	1,437
Plainfield	319	48	241	10	16	11	683
Russell	822	127	560	24	36	20	1,648
South Hadley	9,050	903	3,605	287	192	147	15,133
Southampton	2,878	542	1,818	114	109	89	5,816
Southwick	4,837	792	3,022	241	196	130	9,721
Springfield	73,874	3,030	20,792	1,767	1,259	1,557	108,803
Tolland	222	40	183	21	20	10	519
Wales	919	154	608	37	65	24	1,865
Ware	4,740	530	2,678	138	220	94	8,737
West Springfield	16,003	1,219	5,951	576	316	232	25,987
Westfield	19,721	2,147	9,515	713	472	403	34,752
Westhampton	702	115	568	32	38	22	1,547
Wilbraham	7,773	843	3,305	239	202	147	13,700
Williamsburg	1,450	189	915	68	37	42	2,876
Worthington	627	124	526	30	24	24	1,415
Pioneer Valley	312,093	25,629	123,739	9,232	7,533	6,210	515,445

Source: Massachusetts Department of Revenue

Table A5-32 – Registered Motor Vehicles in the Pioneer Valley – 2015

	Automobiles	Trailers	Light Trucks/SUVs	Heavy Trucks	Motorcycles	Other	Total
Agawam	13,182	1,682	9,288	791	639	1,638	27,220
Amherst	8,825	531	3,985	179	166	792	14,478
Belchertown	6,402	1,186	5,669	281	449	938	14,925
Blandford	455	132	602	42	60	97	1,388
Brimfield	1,544	402	1,487	137	170	354	4,094
Chester	484	130	620	31	67	97	1,429
Chesterfield	483	143	586	28	56	95	1,391
Chicopee	22,975	2,312	15,441	875	1,025	2,161	44,789
Cummington	385	61	381	30	52	79	988
East Longmeadow	7,190	974	5,511	396	334	794	15,199
Easthampton	7,547	807	5,084	188	396	919	14,941
Goshen	431	107	449	72	43	85	1,187
Granby	2,685	677	2,576	185	209	368	6,700
Granville	653	215	756	75	94	103	1,896
Hadley	2,418	476	1,830	156	122	345	5,347
Hampden	2,269	549	2,189	174	182	320	5,683
Hatfield	1,617	398	1,370	311	104	311	4,111
Holland	1,097	258	995	36	125	208	2,719
Holyoke	13,224	722	8,452	300	426	1,151	24,275
Huntington	786	229	963	60	94	167	2,299
Longmeadow	7,342	475	4,632	176	156	700	13,481
Ludlow	8,885	1,436	7,098	706	545	1,030	19,700
Middlefield	156	58	248	15	16	48	541
Monson	3,461	923	3,581	319	363	507	9,154
Montgomery	338	127	423	26	50	65	1,029
Northampton	12,573	907	6,380	358	398	1,232	21,848
Palmer	5,334	967	4,546	420	420	660	12,347
Pelham	639	89	419	22	37	60	1,266
Plainfield	298	53	307	20	20	50	748
Russell	634	180	728	32	76	120	1,770
South Hadley	7,151	990	5,144	345	310	844	14,784
Southampton	2,663	711	2,575	177	225	431	6,782
Southwick	4,185	891	3,836	324	354	617	10,207
Springfield	49,558	2,462	31,078	1,467	1,465	4,463	90,493
Tolland	200	71	250	23	29	37	610
Wales	766	177	780	45	73	120	1,961
Ware	3,662	650	3,620	174	301	499	8,906
West Springfield	12,319	1,257	8,238	835	459	1,217	24,325
Westfield	15,648	2,411	12,821	874	920	2,227	34,901
Westhampton	671	160	776	65	64	147	1,883
Wilbraham	6,674	892	5,104	305	333	848	14,156
Williamsburg	1,225	169	942	80	76	149	2,641
Worthington	503	144	558	29	59	114	1,407
Pioneer Valley	239,537	28,191	172,318	11,184	11,562	27,207	489,999

Source: Massachusetts Department of Revenue

Table A5-33 – Percent Change in Registered Motor Vehicles, 2000-2015

	Automobiles	Trailers	Light Trucks/SUVs	Heavy Trucks	Motorcycles	Other	Total
Agawam	(20.0%)	4.4%	35.9%	20.0%	76.5%	591.1%	(2.6%)
Amherst	(28.7%)	4.5%	21.0%	18.5%	(1.2%)	227.3%	(21.0%)
Belchertown	(3.0%)	25.1%	50.4%	39.8%	72.0%	391.1%	18.0%
Blandford	(27.4%)	3.1%	24.1%	121.1%	66.7%	546.7%	1.4%
Brimfield	(12.4%)	24.8%	24.1%	45.7%	71.7%	372.0%	10.1%
Chester	(25.1%)	12.1%	7.6%	0.0%	39.6%	410.5%	(3.6%)
Chesterfield	(8.0%)	50.5%	15.6%	7.7%	64.7%	313.0%	11.0%
Chicopee	(23.7%)	4.6%	47.3%	(0.3%)	57.0%	369.8%	(4.8%)
Cumington	(26.4%)	(19.7%)	3.8%	36.4%	100.0%	154.8%	(10.3%)
East Longmeadow	(14.9%)	20.8%	57.7%	53.5%	78.6%	267.6%	5.3%
Easthampton	(15.6%)	19.6%	32.0%	13.9%	36.1%	381.2%	0.8%
Goshen	(7.7%)	10.3%	27.6%	148.3%	59.3%	507.1%	14.8%
Granby	(15.8%)	18.2%	28.9%	58.1%	59.5%	275.5%	4.6%
Granville	(19.0%)	34.4%	21.2%	5.6%	67.9%	296.2%	3.0%
Hadley	(12.6%)	33.3%	27.5%	25.8%	130.2%	353.9%	4.6%
Hampden	(19.4%)	20.7%	38.2%	41.5%	83.8%	363.8%	2.8%
Hatfield	(18.5%)	(10.4%)	22.3%	31.8%	100.0%	344.3%	(1.2%)
Holland	(12.2%)	43.3%	20.6%	63.6%	78.6%	732.0%	10.1%
Holyoke	(28.8%)	(3.9%)	55.4%	7.1%	31.1%	296.9%	(10.1%)
Huntington	(24.0%)	38.8%	19.6%	25.0%	62.1%	328.2%	3.9%
Longmeadow	(23.5%)	29.1%	58.1%	300.0%	51.5%	900.0%	(11.3%)
Ludlow	(17.5%)	30.1%	42.4%	64.2%	78.1%	465.9%	4.7%
Middlefield	(33.9%)	28.9%	8.3%	36.4%	(27.3%)	242.9%	(6.4%)
Monson	(15.5%)	29.3%	27.9%	54.9%	67.3%	326.1%	7.4%
Montgomery	(11.1%)	27.0%	22.6%	36.8%	138.1%	400.0%	12.2%
Northampton	(19.6%)	2.8%	20.8%	5.3%	18.8%	372.0%	(11.0%)
Palmer	(21.0%)	15.5%	30.4%	36.8%	53.3%	292.9%	0.3%
Pelham	(18.6%)	(10.1%)	16.7%	(8.3%)	117.6%	150.0%	(11.9%)
Plainfield	(6.6%)	10.4%	27.4%	100.0%	25.0%	354.5%	9.5%
Russell	(22.9%)	41.7%	30.0%	33.3%	111.1%	500.0%	7.4%
South Hadley	(21.0%)	9.6%	42.7%	20.2%	61.5%	474.1%	(2.3%)
Southampton	(7.5%)	31.2%	41.6%	55.3%	106.4%	384.3%	16.6%
Southwick	(13.5%)	12.5%	26.9%	34.4%	80.6%	374.6%	5.0%
Springfield	(32.9%)	(18.7%)	49.5%	(17.0%)	16.4%	186.6%	(16.8%)
Tolland	(9.9%)	77.5%	36.6%	9.5%	45.0%	270.0%	17.5%
Wales	(16.6%)	14.9%	28.3%	21.6%	12.3%	400.0%	5.1%
Ware	(22.7%)	22.6%	35.2%	26.1%	36.8%	430.9%	1.9%
West Springfield	(23.0%)	3.1%	38.4%	45.0%	45.3%	424.6%	(6.4%)
Westfield	(20.7%)	12.3%	34.7%	22.6%	94.9%	452.6%	0.4%
Westhampton	(4.4%)	39.1%	36.6%	103.1%	68.4%	568.2%	21.7%
Wilbraham	(14.1%)	5.8%	54.4%	27.6%	64.9%	476.9%	3.3%
Williamsburg	(15.5%)	(10.6%)	3.0%	17.6%	105.4%	254.8%	(8.2%)
Worthington	(19.8%)	16.1%	6.1%	(3.3%)	145.8%	375.0%	(0.6%)
Pioneer Valley	(23.2%)	10.0%	39.3%	21.1%	53.5%	338.1%	(4.9%)

Source: Massachusetts Department of Revenue

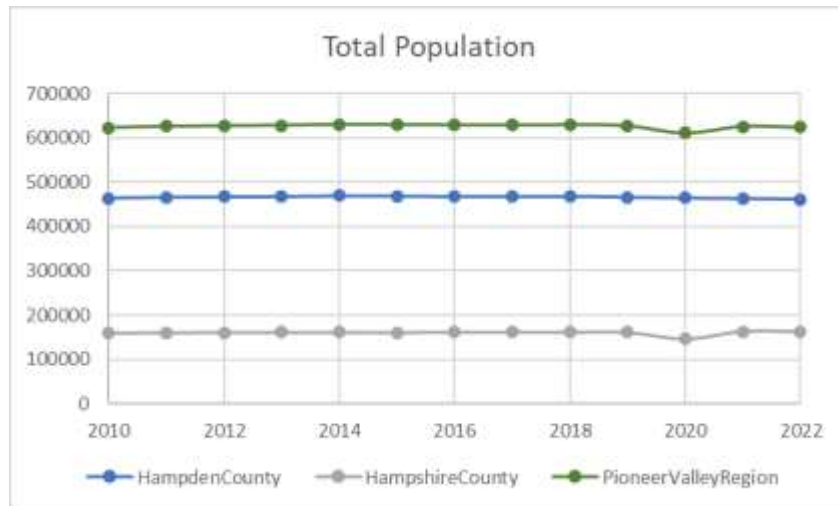
P. INDICATORS OF HOUSING CHANGE IN THE PIONEER VALLEY REGION

Tables depicting data for all municipalities in Hampden and Hampshire county areas can be found for each indicator at the end of this section.

1. Population Trends

Population trends from 2010-2020 were fairly stable with a very slight decrease over the decade. There was a slight dip in 2020 for Hampshire County. This may be due to undercounting during the Covid-19 pandemic, aging populations, covid fatalities, or people moving to different places. As shown in this analysis, the housing market has experienced much more volatility than the population itself.

Figure A5-28 – County Population Trends



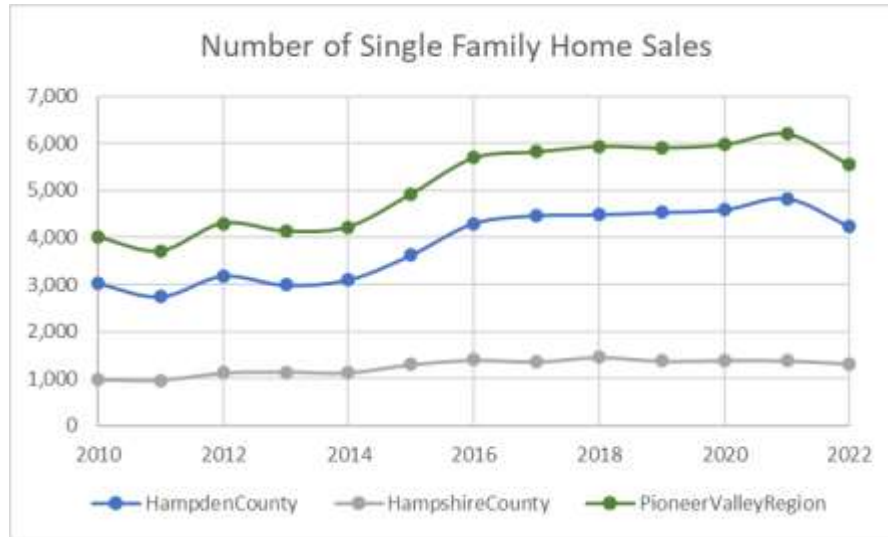
Source: United States Census Bureau

2. Existing Housing Market

Single Family home sales increased consistently between 2010-2021, with the exception of a slight decrease in 2013. In subsequent years, there were significant increases in sales in both counties between 2014-16 as well as between 2020-2021. Sales began to slow across the region in 2022.

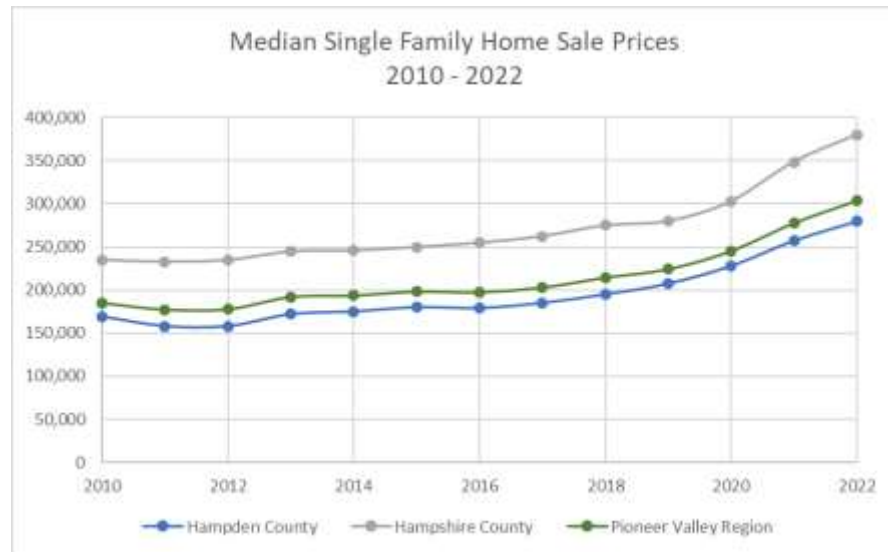
While there was some variation in the number of annual sales of single-family home sales throughout the decade, the median sales price of those homes consistently increased. In 2020, pressure from the Covid-19 pandemic pushed these prices to new heights, with the median sale price of a -family home in the region reaching \$380,000 in Hampshire County in 2022 and \$303,680 across the region in the same year.

Figure A5-29 – Single Family Home Sales



Source: Warren Group

Figure A5-30 – Median Single Family Home Sale Prices

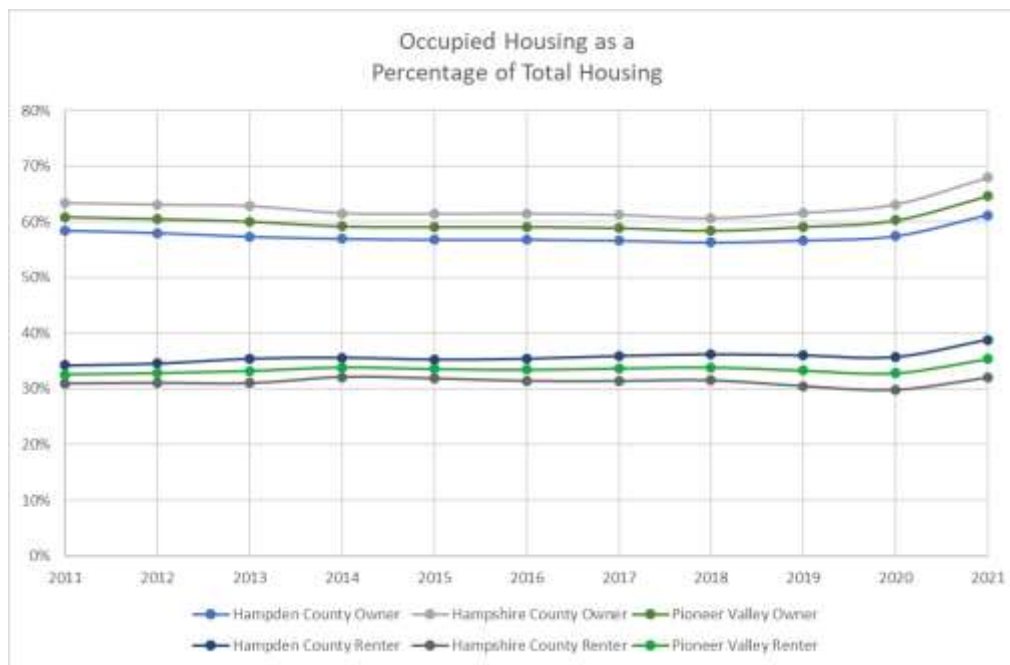


Source: Warren Group

3. Renter Vs. Owner Occupancy

The renter and owner rates have been mostly stable throughout the decade. Throughout the decade, approximately two thirds of housing units have been owner occupied and about one third have been renter-occupied. Post Covid there has been a slight increase in both renter and owner occupancy rates. This indicates a decrease in the number of housing units that remain vacant or available for seasonal use.

Figure A5-31 – Owner Occupied Housing by County

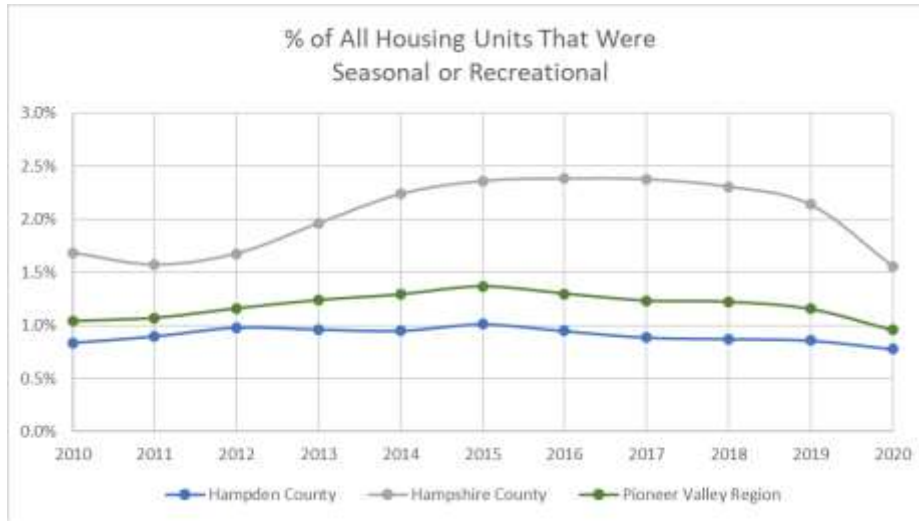


Source: U.S. Census Bureau

4. Shifts in Existing Housing Use: Seasonal Housing vs. Permanent Places of Residence

As indicated by the occupancy data, when demand for permanent housing shifts, there are sometimes shifts within a community in how many homes are used for seasonal or recreational purposes. This figure depicts the portion of all housing units that are being used for seasonal or recreational purposes rather than as primary residences. Until 2015, there was a trend of increasing seasonal use of housing units throughout the region, particularly in Hampshire County. However, this trend began to slow and shift and reverse starting in 2016. In 2020, there was an even more significant shift in housing units that had been used for seasonal purposes rather than primary residences. This coincided with the Covid-19 Pandemic when many residents of larger cities in the Northeast moved to more rural and suburban areas in Western Massachusetts. The decreasing trend was much more drastic in Hampshire County than in the Hampden County area. Below is another graphic showing these trends.

Figure A5-32 – Seasonal and Recreational Housing by County



Source: U.S. Census Bureau

Figure A5-33 – % Change in Seasonal and Recreational Housing by County



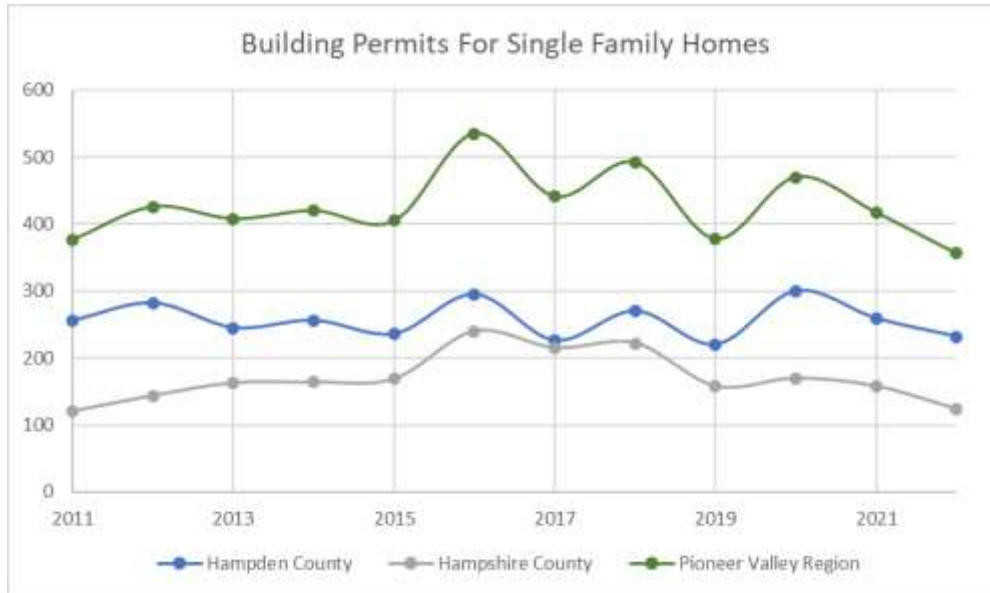
Source: U.S. Census Bureau

5. New Construction of Single-Family Homes

In conjunction with tracking sales of existing single-family homes, building permits data also help measure increased demand for housing. Building permits for single family homes have often followed trends in single-family homes sales. While rates ended the decade similar to where they started, there were some fluctuations. Between 2016 to 2019 the numbers of permits issued became quite variable reaching a high of over 500 in 2016 to a low of

just under 400 in 2019, before stabilizing. In the last 2 years there has been a decrease in new home construction permits issued.

Figure A5-34 – Building Permits for Single Family Homes by County



Source: U.S. Census Bureau

Q. INDICATORS OF CHANGE DATA BY MUNICIPALITY

Table A5-34 – Population Trends

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hampden County	464,237	466,171	466,955	467,747	469,455	469,113	467,778	467,705	468,388	466,372	464,407	462,849	461,041
Hampshire County	159,329	160,154	160,419	160,856	160,918	160,709	161,404	161,077	161,139	160,830	146,592	163,088	162,588
Pioneer Valley Region	623,566	626,325	627,374	628,603	630,373	629,822	629,182	628,782	629,527	627,202	610,999	625,937	623,629
Agawam	28,451	28,608	28,653	28,726	28,733	28,762	28,696	28,683	28,733	28,613	28,622	28,443	28,393
Amherst	38,720	39,052	39,016	39,670	39,781	39,887	40,011	39,492	39,757	39,924	39,489	39,378	39,378
Belchertown	14,658	14,744	14,789	14,801	14,811	14,847	14,949	15,056	15,076	15,098	15,327	15,357	15,316
Blandford	1,227	1,236	1,238	1,244	1,249	1,248	1,247	1,250	1,257	1,252	1,214	1,213	1,210
Brimfield	3,619	3,539	3,577	3,623	3,632	3,637	3,643	3,651	3,679	3,680	3,687	3,690	3,690
Chester	1,339	1,350	1,357	1,363	1,370	1,375	1,377	1,376	1,377	1,369	1,228	1,223	1,220
Chesterfield	1,226	1,237	1,243	1,249	1,247	1,244	1,255	1,255	1,254	1,249	1,186	1,184	1,175
Chicopee	55,306	55,630	55,840	55,923	56,274	55,820	55,342	55,336	55,424	55,126	55,443	55,228	54,980
Cummington	868	868	872	873	869	865	870	873	874	874	827	824	818
Easthampton	15,792	15,904	15,983	16,059	16,165	16,201	16,226	16,261	16,285	16,192	16,382	16,342	16,343
East Longmeadow	16,052	16,073	16,109	16,080	16,051	15,996	16,038	16,008	15,934	15,829	16,176	16,098	16,045
Goshe	1,058	1,062	1,065	1,067	1,068	1,066	1,068	1,065	1,061	1,059	959	955	947
Granby	6,242	6,274	6,316	6,324	6,326	6,322	6,332	6,329	6,326	6,291	6,102	6,086	6,055
Granville	1,571	1,593	1,608	1,613	1,619	1,615	1,615	1,618	1,622	1,611	1,536	1,535	1,528
Hadley	5,252	5,275	5,311	5,305	5,301	5,293	5,289	5,314	5,330	5,342	5,308	5,280	5,270
Hampden	5,141	5,160	5,164	5,170	5,191	5,200	5,183	5,175	5,199	5,177	4,953	4,940	4,915
Hatfield	3,259	3,265	3,274	3,284	3,273	3,276	3,295	3,271	3,263	3,251	3,337	3,330	3,314
Holland	2,480	2,486	2,487	2,493	2,496	2,493	2,489	2,484	2,491	2,482	2,596	2,586	2,573
Holyoke	39,917	40,157	40,221	40,132	40,697	40,357	40,262	40,223	40,314	40,117	38,154	37,873	37,720
Huntington	2,184	2,185	2,187	2,184	2,181	2,175	2,185	2,185	2,181	2,169	2,092	2,084	2,069
Longmeadow	15,807	15,870	15,879	15,885	15,888	15,879	15,823	15,751	15,796	15,705	15,812	15,700	15,632
Ludlow	21,136	21,245	21,242	21,221	21,265	21,256	21,354	21,322	21,290	21,233	20,762	20,858	20,871
Middlefield	519	525	530	532	529	526	531	529	528	534	385	390	388
Monson	8,570	8,580	8,673	8,721	8,749	8,763	8,768	8,770	8,809	8,787	8,126	8,109	8,090
Montgomery	846	858	863	867	868	867	864	866	870	866	817	816	818
Northampton	28,663	28,731	28,737	28,609	28,576	28,399	28,550	28,583	28,603	28,451	27,300	29,480	29,327
Palmer	12,141	12,179	12,193	12,209	12,224	12,211	12,232	12,237	12,286	12,232	12,422	12,384	12,337
Pelham	1,323	1,328	1,333	1,330	1,326	1,325	1,325	1,323	1,321	1,313	1,280	1,271	1,266
Plainfield	648	650	649	652	650	649	656	660	662	661	629	631	629
Russell	1,784	1,797	1,798	1,800	1,799	1,797	1,795	1,793	1,799	1,792	1,638	1,636	1,631
Southampton	17,734	17,828	17,843	17,723	17,718	17,626	17,762	17,828	17,721	17,625	16,282	18,157	18,046
SouthHadley	5,807	5,896	5,958	6,005	6,057	6,103	6,143	6,178	6,176	6,171	6,215	6,219	6,207
Southwick	9,506	9,557	9,585	9,625	9,684	9,703	9,702	9,719	9,766	9,740	9,216	9,210	9,190
Springfield	153,569	153,773	153,933	154,056	154,376	154,582	154,028	154,207	154,329	153,606	155,407	154,948	154,064
Tolland	490	493	494	494	496	497	498	503	508	508	469	467	467
Wales	1,844	1,856	1,865	1,876	1,877	1,890	1,884	1,882	1,884	1,874	1,827	1,818	1,807
Ware	9,868	9,901	9,914	9,896	9,868	9,833	9,838	9,816	9,772	9,711	10,091	10,226	10,385
Westfield	28,357	28,542	28,630	28,616	28,653	28,661	28,602	28,577	28,639	28,517	28,766	28,666	28,501
Westhampton	41,118	41,436	41,295	41,589	41,664	41,716	41,561	41,405	41,324	41,204	40,740	40,626	40,535
West Springfield	1,603	1,606	1,606	1,605	1,625	1,622	1,631	1,633	1,635	1,637	1,616	1,622	1,620
Wilbraham	14,226	14,322	14,377	14,442	14,486	14,583	14,587	14,616	14,707	14,689	14,590	14,538	14,526
Williamsburg	2,486	2,489	2,495	2,490	2,482	2,473	2,487	2,488	2,481	2,466	2,498	2,488	2,469
Worthington	1,159	1,165	1,172	1,177	1,179	1,182	1,189	1,191	1,184	1,175	1,191	1,188	1,183

Source: U.S. Census Bureau

Table A5-35 – Singles Family Home Sales

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hampden County	3,035	2,747	3,186	2,993	3,104	3,628	4,302	4,467	4,489	4,537	4,592	4,829	4,235
Hampshire County	976	963	1,116	1,140	1,122	1,297	1,394	1,359	1,454	1,374	1,388	1,382	1,314
Pioneer Valley Region	4,011	3,710	4,302	4,133	4,226	4,925	5,696	5,826	5,943	5,911	5,980	6,211	5,549
Agawam	177	170	179	210	219	239	264	245	249	248	307	290	253
Amherst	108	105	148	135	146	150	147	160	190	170	175	166	167
Belchertown	119	111	140	133	150	157	190	170	184	153	190	166	173
Blandford	9	6	9	8	12	12	20	22	18	18	20	10	14
Brimfield	44	19	30	23	44	38	53	38	57	39	34	53	49
Chester	18	12	16	9	13	11	13	20	22	16	15	24	18
Chesterfield	7	12	9	12	10	13	18	13	12	15	15	15	19
Chicopee	330	285	304	294	309	354	437	468	455	411	410	471	388
Cummington	6	10	5	8	11	6	9	11	12	11	14	11	12
Easthampton	156	142	165	183	156	194	238	234	228	264	268	242	222
East Longmeadow	108	129	139	127	127	172	171	150	163	166	129	125	128
Goshen	14	13	10	14	10	17	9	16	15	19	13	19	12
Granby	70	51	51	56	49	70	65	77	72	84	79	69	77
Granville	10	12	15	12	12	25	24	13	10	12	15	17	14
Hadley	43	50	39	50	37	41	50	47	58	54	41	64	48
Hampden	34	36	50	47	40	47	50	57	52	78	72	73	54
Hatfield	21	20	32	25	22	27	34	46	42	33	37	26	32
Holland	43	32	34	41	38	51	69	74	47	64	61	69	46
Holyoke	151	148	191	162	170	206	221	236	212	209	221	245	233
Huntington	16	14	7	18	20	17	32	24	29	23	45	24	27
Longmeadow	196	165	210	189	207	231	224	254	270	287	273	298	236
Ludlow	136	113	162	156	139	167	176	212	221	213	224	234	191
Middlefield	4	4	1	1	4	11	8	8	2	5	14	7	5
Monson	69	55	63	64	83	66	92	112	93	98	80	106	95
Montgomery	7	3	4	7	8	10	11	9	9	8	9	10	9
Northampton	173	162	189	213	190	225	217	200	203	203	208	213	185
Palmer	101	89	83	80	103	112	134	145	135	134	124	130	141
Pelham	6	5	17	11	9	15	14	14	17	19	16	20	23
Plainfield	2	3	4	5	3	8	7	8	1	5	8	4	5
Russell	13	8	22	11	15	23	22	23	15	22	32	23	20
Southampton	122	135	136	150	146	171	193	164	199	201	158	209	149
SouthHadley	51	47	56	64	67	55	72	65	92	51	83	59	80
Southwick	77	74	89	81	114	95	103	107	113	108	144	137	100
Springfield	908	834	913	782	810	983	1,264	1,327	1,390	1,389	1,400	1,470	1,309
Tolland	8	6	6	6	8	16	13	9	12	12	15	8	17
Wales	21	15	22	21	16	32	19	20	28	22	27	27	27
Ware	69	51	81	64	68	89	92	132	108	111	104	128	106
Westfield	172	166	188	203	197	224	288	271	269	329	299	258	259
Westhampton	218	244	290	277	275	330	375	352	380	363	334	412	350
West Springfield	10	9	19	25	20	20	20	13	15	21	19	17	27
Wilbraham	137	113	141	127	116	162	192	219	204	193	208	222	190
Williamsburg	17	20	20	16	22	18	27	28	24	14	22	19	21
Worthington	10	12	13	13	11	15	19	13	16	16	18	21	18

Source: The Warren Group

Table A5-36 – Median Sale Price of Single-Family Homes

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hampden County	\$169,000	\$158,000	\$157,950	\$172,000	\$175,000	\$180,000	\$179,000	\$185,000	\$195,000	\$207,500	\$228,000	\$257,500	\$280,000
Hampshire County	\$235,000	\$233,000	\$235,000	\$245,000	\$246,000	\$250,000	\$255,000	\$262,500	\$275,000	\$280,000	\$303,000	\$348,650	\$380,000
Pioneer Valley Region	\$185,060	\$177,468	\$177,938	\$192,135	\$193,850	\$198,435	\$197,600	\$203,078	\$214,573	\$224,352	\$245,408	\$277,782	\$303,680
Agawam	\$214,000	\$192,500	\$183,000	\$205,000	\$210,000	\$205,000	\$217,500	\$221,000	\$225,000	\$236,250	\$249,000	\$290,000	\$308,000
Amherst	\$324,350	\$310,000	\$300,000	\$343,000	\$319,350	\$333,250	\$331,000	\$337,000	\$360,000	\$379,450	\$419,900	\$447,500	\$489,000
Belchertown	\$240,000	\$237,400	\$248,750	\$240,000	\$245,000	\$256,000	\$265,000	\$268,850	\$269,950	\$296,000	\$328,750	\$347,500	\$379,000
Blandford	\$190,000	\$180,125	\$180,000	\$186,850	\$164,000	\$210,000	\$155,000	\$196,000	\$196,250	\$187,450	\$232,000	\$245,000	\$327,500
Brimfield	\$205,000	\$168,000	\$157,500	\$212,500	\$216,250	\$216,000	\$230,000	\$217,450	\$229,000	\$267,000	\$286,000	\$341,600	\$355,000
Chester	\$145,000	\$111,000	\$142,500	\$236,000	\$127,500	\$178,000	\$165,000	\$137,500	\$177,500	\$187,450	\$154,500	\$225,000	\$205,000
Chesterfield	\$155,000	\$164,000	\$193,800	\$210,000	\$209,500	\$190,000	\$196,000	\$245,000	\$246,750	\$265,000	\$305,500	\$354,500	\$400,000
Chicopee	\$160,000	\$144,000	\$145,000	\$155,000	\$161,000	\$167,500	\$166,000	\$174,700	\$180,000	\$190,000	\$219,900	\$245,000	\$265,000
Cummington	\$90,050	\$166,500	\$85,575	\$156,950	\$180,000	\$300,450	\$160,000	\$113,500	\$170,500	\$215,500	\$215,750	\$400,000	\$187,500
East Longmeadow	\$228,000	\$217,500	\$215,000	\$225,000	\$207,500	\$240,000	\$231,750	\$249,500	\$254,000	\$251,500	\$297,250	\$305,000	\$330,000
Easthampton	\$219,950	\$219,000	\$215,000	\$224,500	\$225,000	\$220,000	\$225,000	\$249,900	\$260,000	\$280,000	\$285,000	\$337,500	\$380,000
Goshen	\$185,000	\$230,000	\$195,000	\$172,000	\$225,750	\$250,000	\$195,000	\$216,000	\$185,000	\$235,000	\$258,000	\$290,000	\$367,500
Granby	\$209,500	\$217,000	\$221,000	\$206,250	\$212,000	\$221,500	\$230,000	\$249,900	\$241,500	\$273,000	\$240,000	\$311,000	\$310,000
Granville	\$235,000	\$190,000	\$222,000	\$223,500	\$240,000	\$222,500	\$236,500	\$195,000	\$220,000	\$284,000	\$241,200	\$260,000	\$390,000
Hadley	\$268,847	\$305,000	\$304,500	\$308,250	\$330,000	\$307,000	\$320,000	\$318,000	\$353,500	\$349,500	\$400,000	\$450,250	\$469,000
Hampden	\$232,500	\$249,500	\$219,000	\$258,000	\$210,450	\$220,000	\$223,250	\$237,000	\$240,450	\$276,750	\$285,000	\$322,000	\$332,500
Hatfield	\$310,000	\$250,000	\$260,000	\$259,000	\$302,000	\$299,000	\$298,950	\$281,750	\$277,500	\$290,000	\$305,000	\$344,950	\$347,500
Holland	\$155,500	\$129,000	\$152,500	\$169,000	\$184,000	\$218,000	\$190,000	\$205,000	\$214,900	\$255,000	\$235,000	\$250,000	\$310,000
Holyoke	\$155,900	\$146,850	\$150,000	\$162,450	\$172,750	\$166,200	\$169,900	\$179,650	\$199,900	\$210,000	\$215,000	\$236,000	\$267,000
Huntington	\$180,000	\$120,000	\$189,900	\$202,950	\$210,750	\$226,000	\$200,250	\$239,950	\$172,500	\$260,000	\$220,000	\$294,500	\$324,900
Longmeadow	\$307,000	\$316,000	\$276,500	\$302,000	\$330,000	\$315,000	\$315,750	\$314,950	\$328,250	\$340,000	\$349,000	\$388,450	\$430,100
Ludlow	\$188,000	\$190,250	\$172,000	\$182,000	\$203,000	\$199,900	\$190,000	\$199,900	\$215,000	\$230,000	\$240,000	\$265,000	\$275,000
Middlefield	\$137,500	\$170,000	\$-	\$-	\$199,000	\$161,500	\$196,000	\$202,500	\$-	\$150,000	\$231,250	\$223,900	\$191,000
Monson	\$192,000	\$169,000	\$179,000	\$224,000	\$205,000	\$215,000	\$207,956	\$207,000	\$228,000	\$239,500	\$274,500	\$300,000	\$315,000
Montgomery	\$268,000	\$201,000	\$296,000	\$287,000	\$275,700	\$284,000	\$214,000	\$248,000	\$183,500	\$280,500	\$297,000	\$270,000	\$325,000
Northampton	\$255,000	\$250,000	\$275,000	\$274,000	\$299,500	\$279,000	\$311,500	\$298,250	\$336,000	\$347,000	\$348,500	\$420,250	\$432,000
Palmer	\$170,300	\$152,000	\$153,000	\$170,792	\$168,000	\$163,375	\$167,500	\$174,990	\$189,000	\$206,500	\$225,000	\$254,000	\$275,000
Pelham	\$322,500	\$220,000	\$250,000	\$285,000	\$292,500	\$260,500	\$274,500	\$323,500	\$240,000	\$330,000	\$372,500	\$430,000	\$360,000
Plainfield	\$-	\$285,000	\$192,875	\$185,000	\$114,000	\$157,380	\$194,782	\$151,000	\$-	\$214,000	\$276,500	\$402,500	\$300,000
Russell	\$208,000	\$245,000	\$186,250	\$175,400	\$152,000	\$205,000	\$167,000	\$184,500	\$250,000	\$210,000	\$230,000	\$290,000	\$304,750
South Hadley	\$197,000	\$190,000	\$188,200	\$205,500	\$215,500	\$205,000	\$220,000	\$223,250	\$240,000	\$242,000	\$250,288	\$300,000	\$330,000
Southampton	\$235,000	\$277,409	\$264,500	\$272,000	\$260,000	\$268,000	\$273,950	\$303,000	\$335,000	\$303,000	\$350,000	\$400,000	\$435,000
Southwick	\$215,000	\$215,327	\$200,000	\$229,900	\$232,000	\$235,500	\$265,000	\$249,900	\$260,000	\$277,500	\$277,500	\$330,000	\$344,950
Springfield	\$120,000	\$109,900	\$106,900	\$125,000	\$124,000	\$130,000	\$136,000	\$144,900	\$155,000	\$165,000	\$190,000	\$225,000	\$247,000
Tolland	\$240,000	\$251,650	\$191,500	\$206,450	\$205,000	\$193,700	\$222,500	\$290,000	\$277,250	\$235,000	\$246,000	\$246,700	\$241,800
Wales	\$155,000	\$145,500	\$137,550	\$167,000	\$171,250	\$163,750	\$200,000	\$200,950	\$213,500	\$200,000	\$243,000	\$212,800	\$235,000
Ware	\$169,000	\$160,000	\$150,000	\$160,000	\$168,500	\$173,500	\$164,500	\$176,000	\$170,000	\$192,000	\$229,700	\$266,500	\$285,000
West Springfield	\$189,000	\$179,450	\$182,500	\$180,000	\$181,000	\$190,500	\$190,000	\$199,600	\$214,000	\$220,000	\$240,900	\$266,250	\$290,000
Westfield	\$191,375	\$205,000	\$190,500	\$190,000	\$203,000	\$214,250	\$215,000	\$220,000	\$226,500	\$233,000	\$262,500	\$281,500	\$313,450
Westhampton	\$247,625	\$380,000	\$229,000	\$292,000	\$247,500	\$322,950	\$258,500	\$300,000	\$295,000	\$270,000	\$297,500	\$425,000	\$435,000
Wilbraham	\$275,000	\$243,000	\$240,000	\$245,000	\$244,000	\$259,450	\$270,000	\$275,000	\$286,000	\$275,000	\$323,750	\$374,500	\$385,000
Williamsburg	\$262,500	\$284,500	\$268,250	\$261,000	\$238,000	\$243,500	\$243,500	\$290,100	\$255,000	\$395,000	\$329,500	\$390,000	\$315,000
Worthington	\$164,000	\$161,250	\$170,000	\$193,000	\$150,000	\$178,000	\$215,000	\$171,035	\$193,125	\$214,500	\$250,000	\$280,000	\$286,000

Source: The Warren Group

Table A5-37 – Owner Occupancy

Owner Occupied	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hampden County	58.4%	58.0%	57.3%	56.9%	56.8%	56.8%	56.6%	56.3%	56.7%	57.4%	61.2%
Hampshire County	63.4%	63.1%	62.9%	61.5%	61.4%	61.5%	61.2%	60.6%	61.6%	63.1%	68.0%
Pioneer Valley Region	60.9%	60.5%	60.1%	59.2%	59.1%	59.1%	58.9%	58.4%	59.1%	60.3%	64.6%
Agawam	75.3%	73.9%	72.2%	71.8%	71.4%	71.1%	72.7%	73.7%	73.1%	73.1%	75.7%
Amherst	45.7%	43.3%	42.6%	40.4%	39.8%	40.0%	40.5%	39.5%	41.7%	43.0%	45.5%
Belchertown	78.2%	77.2%	77.9%	76.7%	74.7%	75.1%	74.7%	75.8%	75.7%	78.5%	84.0%
Blandford	79.8%	82.3%	82.6%	79.8%	80.4%	77.3%	75.6%	76.9%	74.9%	73.1%	93.3%
Brimfield	81.3%	78.0%	78.0%	74.8%	75.1%	73.4%	75.7%	74.0%	75.7%	77.6%	88.9%
Chester	77.0%	73.1%	72.0%	69.2%	68.6%	65.9%	67.8%	66.1%	69.6%	56.1%	79.1%
Chesterfield	73.6%	71.5%	72.3%	76.0%	75.0%	72.8%	74.4%	75.1%	73.2%	72.9%	87.2%
Chicopee	54.7%	54.2%	53.5%	52.6%	52.7%	54.3%	53.3%	53.1%	54.6%	55.1%	57.6%
Cumington	69.4%	72.4%	70.4%	74.5%	71.7%	69.8%	66.6%	68.0%	64.9%	62.4%	79.1%
East Longmeadow	59.2%	58.2%	58.5%	55.7%	54.7%	53.2%	53.6%	54.6%	57.3%	59.4%	62.1%
Easthampton	84.7%	84.6%	84.3%	83.2%	81.5%	80.3%	80.2%	79.3%	78.8%	79.4%	84.6%
Goshen	66.3%	65.6%	69.6%	73.4%	72.9%	71.0%	65.3%	60.9%	55.4%	52.8%	90.3%
Granby	81.1%	82.1%	80.3%	78.4%	81.7%	82.9%	83.6%	82.6%	84.0%	86.3%	87.2%
Granville	88.6%	89.5%	86.5%	81.7%	78.3%	79.8%	78.8%	82.1%	84.1%	88.6%	95.4%
Hadley	65.9%	65.0%	62.5%	62.3%	67.5%	69.5%	73.7%	75.1%	75.9%	76.1%	76.5%
Hampden	86.4%	90.2%	91.6%	90.3%	89.5%	87.5%	86.1%	83.9%	86.1%	87.2%	94.5%
Hatfield	70.5%	71.0%	74.1%	73.0%	72.0%	70.3%	68.1%	65.2%	64.8%	64.0%	70.0%
Holland	63.2%	58.7%	60.8%	60.8%	59.3%	59.8%	62.1%	60.6%	63.3%	66.2%	90.3%
Holyoke	38.6%	39.1%	38.1%	37.4%	36.9%	37.8%	36.7%	36.9%	36.6%	36.2%	39.6%
Huntington	66.9%	64.4%	61.1%	60.2%	66.4%	64.6%	62.6%	65.2%	68.1%	69.0%	82.2%
Longmeadow	87.8%	86.9%	86.7%	86.6%	86.8%	87.5%	87.0%	88.4%	87.9%	88.1%	92.2%
Ludlow	74.7%	74.9%	73.5%	73.5%	72.7%	69.8%	68.9%	69.2%	68.7%	71.6%	74.0%
Middlefield	69.2%	61.6%	70.7%	78.7%	75.9%	74.5%	76.3%	71.2%	68.6%	66.7%	94.4%
Monson	78.1%	76.1%	77.9%	78.8%	77.9%	78.4%	79.5%	79.3%	78.0%	79.4%	82.6%
Montgomery	89.8%	90.4%	89.1%	89.1%	90.5%	92.1%	86.0%	86.8%	87.0%	85.2%	96.1%
Northampton	53.8%	55.5%	54.5%	54.1%	52.9%	52.6%	51.3%	50.4%	51.9%	54.6%	58.6%
Palmer	66.2%	62.3%	62.6%	61.7%	65.1%	67.5%	68.2%	64.8%	65.1%	70.0%	73.0%
Pelham	79.7%	79.8%	76.5%	76.7%	72.9%	73.6%	75.1%	70.2%	65.9%	61.9%	70.0%
Plainfield	69.2%	67.5%	67.8%		70.8%	69.2%	71.2%	68.7%	68.3%	69.3%	88.2%
Russell	85.1%	83.0%	83.7%	82.8%	80.4%	80.5%	80.9%	77.3%	78.1%	78.3%	86.5%
South Hadley	84.7%	84.0%	82.3%	81.1%	86.7%	88.0%	90.2%	89.3%	90.9%	89.6%	89.9%
Southampton	71.6%	71.0%	70.8%	69.3%	69.1%	70.8%	70.1%	70.3%	70.3%	73.9%	77.5%
Southwick	76.1%	77.1%	74.4%	76.9%	76.1%	75.6%	75.1%	78.0%	76.2%	75.8%	83.7%
Springfield	45.2%	44.7%	43.8%	43.5%	43.1%	42.7%	42.5%	41.5%	42.4%	43.7%	47.3%
Tolland	30.1%	33.9%	40.2%	37.4%	36.8%	39.4%	41.3%	39.8%	38.9%	38.0%	89.2%
Wales	73.5%	76.3%	72.6%	71.3%	65.9%	67.5%	66.9%	68.8%	69.9%	73.1%	89.2%
Ware	62.7%	62.7%	64.8%	63.6%	65.0%	63.6%	64.8%	60.4%	59.3%	58.5%	67.5%
West Springfield	59.0%	57.0%	56.5%	57.0%	57.6%	56.8%	57.1%	56.4%	57.4%	55.4%	56.4%
Westfield	81.8%	80.2%	78.4%	78.5%	81.1%	81.5%	83.9%	82.4%	82.3%	81.5%	93.3%
Westhampton	64.1%	63.8%	63.2%	63.0%	63.2%	63.7%	64.5%	64.6%	63.8%	64.2%	65.6%
Wilbraham	86.1%	87.2%	87.7%	85.7%	86.5%	86.5%	85.6%	85.6%	86.4%	87.1%	89.7%
Williamsburg	75.3%	76.8%	76.1%	74.1%	70.9%	71.5%	67.7%	63.7%	65.3%	69.3%	77.4%
Worthington	81.1%	77.7%	78.4%	76.5%	72.3%	72.3%	75.2%	76.6%	77.0%	80.5%	93.0%

Source: U.S. Census Bureau

Table A5-38 – Renter Occupancy

Renter Occupied	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hampden County	34.3%	34.6%	35.4%	35.6%	35.3%	35.4%	35.9%	36.2%	36.0%	35.7%	38.8%
Hampshire County	31.0%	31.1%	31.0%	32.1%	31.9%	31.4%	31.4%	31.5%	30.5%	29.9%	32.0%
Pioneer Valley Region	32.6%	32.8%	33.2%	33.9%	33.6%	33.4%	33.7%	33.9%	33.3%	32.8%	35.4%
Agawam	20.6%	21.9%	24.0%	24.1%	25.0%	25.3%	23.8%	22.2%	23.4%	23.5%	24.3%
Amherst	49.2%	49.2%	48.9%	51.8%	51.4%	51.2%	50.7%	50.6%	47.3%	46.9%	54.5%
Belchertown	19.9%	21.3%	20.5%	20.6%	21.7%	19.9%	18.2%	16.6%	17.2%	16.5%	16.0%
Blandford	2.7%	1.3%	3.1%	5.1%	4.6%	4.6%	6.0%	4.0%	3.9%	4.2%	6.7%
Brimfield	15.0%	19.1%	19.0%	20.3%	15.4%	17.0%	10.3%	9.6%	10.3%	11.9%	11.1%
Chester	9.3%	9.1%	9.2%	10.7%	11.9%	11.8%	13.6%	16.5%	16.4%	17.5%	20.9%
Chesterfield	12.9%	14.2%	12.4%	7.4%	7.2%	7.7%	5.9%	6.8%	8.2%	10.4%	12.8%
Chicopee	38.4%	38.5%	39.4%	39.8%	40.1%	39.0%	39.8%	40.1%	38.5%	38.5%	42.4%
Cummington	19.7%	21.6%	20.8%	16.6%	18.9%	16.4%	18.4%	17.7%	19.6%	20.6%	20.9%
East Longmeadow	36.7%	37.9%	37.8%	40.1%	41.0%	41.5%	40.9%	39.8%	36.8%	36.3%	37.9%
Easthampton	12.9%	12.0%	11.9%	12.9%	14.5%	15.3%	16.9%	17.1%	16.5%	16.5%	15.4%
Goshen	10.8%	9.7%	7.3%	6.3%	4.8%	7.9%	8.6%	7.1%	7.6%	9.7%	9.7%
Granby	16.4%	15.3%	16.7%	19.9%	13.8%	14.5%	13.7%	15.2%	12.4%	12.5%	12.8%
Granville	7.1%	7.4%	9.7%	10.8%	12.0%	10.9%	8.6%	4.9%	5.3%	3.1%	4.6%
Hadley	28.4%	27.3%	28.9%	28.6%	24.7%	24.3%	23.2%	20.6%	20.9%	21.8%	23.5%
Hampden	13.6%	8.2%	7.0%	8.2%	7.7%	7.4%	8.5%	10.2%	8.2%	6.8%	5.5%
Hatfield	23.6%	24.1%	23.6%	24.0%	23.9%	23.2%	24.3%	25.6%	25.0%	28.4%	30.0%
Holland	7.8%	11.0%	10.1%	10.7%	9.8%	10.0%	6.6%	9.9%	9.1%	9.8%	9.7%
Holyoke	55.6%	55.1%	55.5%	55.6%	54.4%	53.0%	53.6%	53.7%	53.4%	54.2%	60.4%
Huntington	22.8%	23.5%	21.2%	19.9%	12.4%	11.4%	12.8%	15.3%	14.6%	15.4%	17.8%
Longmeadow	10.4%	10.6%	9.2%	9.2%	8.9%	8.9%	10.7%	9.6%	9.7%	8.8%	7.8%
Ludlow	20.6%	20.6%	21.9%	22.3%	22.1%	23.6%	24.7%	24.5%	25.5%	23.6%	26.0%
Middlefield	2.3%	5.3%	5.4%	5.8%	5.9%	5.9%	2.6%	0.7%	1.8%	2.4%	5.6%
Monson	14.8%	16.7%	17.9%	16.8%	16.8%	16.5%	16.2%	15.6%	16.6%	14.4%	17.4%
Montgomery	2.5%	2.6%	3.8%	3.9%	4.6%	1.7%	2.8%	2.4%	2.2%	3.1%	3.9%
Northampton	40.3%	38.6%	39.6%	40.4%	41.5%	41.5%	42.6%	42.9%	41.6%	38.9%	41.4%
Palmer	26.8%	29.0%	28.7%	28.3%	24.8%	24.0%	23.0%	25.4%	25.7%	22.5%	27.0%
Pelham	15.4%	15.0%	19.5%	16.1%	15.3%	14.8%	14.8%	19.2%	23.9%	29.7%	30.0%
Plainfield	8.5%	8.1%	7.4%		8.2%	8.4%	9.4%	10.6%	14.9%	10.5%	11.8%
Russell	8.2%	9.3%	8.3%	8.0%	8.1%	9.4%	9.7%	11.4%	13.2%	12.6%	13.5%
South Hadley	22.1%	22.9%	23.4%	24.7%	26.4%	25.5%	26.4%	26.4%	26.4%	22.5%	22.5%
Southampton	14.8%	16.0%	17.7%	16.7%	11.5%	9.9%	8.0%	8.6%	9.1%	8.8%	10.1%
Southwick	17.6%	17.4%	17.5%	16.1%	15.3%	17.3%	17.8%	15.8%	17.5%	18.1%	16.3%
Springfield	44.1%	45.0%	46.6%	47.4%	47.2%	47.7%	48.4%	49.1%	48.5%	48.4%	52.7%
Tolland	2.8%	3.7%	2.8%	5.3%	5.8%	7.0%	6.8%	6.4%	4.7%	4.3%	10.8%
Wales	7.3%	8.8%	9.9%	13.8%	17.4%	16.5%	17.8%	17.5%	15.6%	11.6%	10.8%
Ware	28.5%	30.8%	27.7%	27.4%	26.1%	25.7%	23.8%	27.4%	29.2%	30.9%	32.5%
West Springfield	31.5%	31.3%	31.2%	30.5%	29.6%	29.8%	29.6%	30.7%	31.3%	30.2%	34.4%
Westfield	7.8%	7.7%	9.0%	8.7%	9.7%	8.1%	6.2%	7.2%	7.9%	6.4%	6.7%
Westhampton	36.7%	38.1%	39.2%	37.5%	36.9%	37.9%	39.1%	40.2%	40.3%	42.3%	43.6%
Wilbraham	10.3%	8.1%	9.3%	10.7%	10.3%	11.1%	12.2%	11.8%	11.7%	9.0%	10.3%
Williamsburg	22.4%	21.0%	20.1%	21.0%	20.2%	19.7%	23.5%	27.8%	25.8%	25.8%	22.6%
Worthington	11.1%	12.7%	11.6%	9.9%	10.2%	12.6%	11.3%	9.2%	10.4%	7.4%	7.0%

Source. U.S. Census Bureau

Table A5-39 – % of Housing Units That Are Seasonal or Recreational

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Hampden County	0.8%	0.9%	1.0%	1.0%	0.9%	1.0%	0.9%	0.9%	0.9%	0.9%	0.8%
Hampshire County	1.7%	1.6%	1.7%	2.0%	2.2%	2.4%	2.4%	2.4%	2.3%	2.1%	1.6%
Pioneer Valley Region	1.0%	1.1%	1.2%	1.2%	1.3%	1.4%	1.3%	1.2%	1.2%	1.2%	1.0%
Amherst	0.8%	0.5%	0.8%	1.2%	1.1%	1.6%	2.1%	1.8%	1.1%	1.1%	0.5%
Belchertown	1.7%	1.7%	0.6%	0.7%	2.0%	3.2%	3.7%	4.7%	5.3%	4.1%	2.1%
Blandford	16.2%	14.3%	11.0%	7.8%	8.1%	5.8%	7.9%	9.2%	10.6%	14.1%	15.9%
Brimfield	4.8%	1.0%	0.0%	0.0%	1.6%	4.6%	4.7%	7.6%	9.0%	7.2%	5.3%
Chester	9.8%	10.5%	9.5%	8.8%	9.0%	6.8%	8.8%	8.6%	8.9%	7.7%	16.4%
Chesterfield	9.0%	10.3%	10.1%	9.8%	9.4%	9.8%	9.4%	12.7%	10.9%	13.2%	13.0%
Chicopee	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.0%	0.3%	0.4%	0.4%	0.4%
Cummington	8.1%	7.5%	2.2%	2.7%	4.9%	5.2%	9.7%	11.1%	12.5%	11.2%	10.8%
East Longmeadow	0.1%	0.1%	0.2%	0.3%	0.3%	0.2%	0.4%	0.4%	0.3%	0.3%	0.3%
Easthampton	1.2%	0.6%	0.5%	0.4%	0.4%	0.6%	0.5%	0.5%	0.5%	0.7%	0.2%
Goshen	22.0%	21.0%	24.4%	22.8%	20.0%	19.9%	16.0%	20.0%	26.0%	28.4%	30.9%
Granby	0.1%	1.3%	1.3%	1.6%	1.7%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%
Granville	1.5%	1.6%	1.0%	0.5%	1.6%	1.5%	1.5%	2.7%	2.8%	1.7%	1.3%
Hadley	2.3%	3.5%	3.1%	3.3%	2.8%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hampden	0.0%	0.0%	1.7%	1.3%	1.5%	2.8%	2.5%	1.3%	1.5%	1.4%	0.0%
Hatfield	2.1%	2.1%	1.8%	1.8%	2.5%	3.7%	3.8%	4.0%	5.0%	4.1%	0.7%
Holland	20.8%	22.2%	23.8%	23.8%	21.5%	24.7%	25.4%	24.6%	21.9%	22.2%	19.1%
Holyoke	0.0%	0.0%	0.3%	0.2%	0.4%	0.5%	0.5%	0.6%	0.6%	0.4%	0.4%
Huntington	5.6%	8.8%	9.0%	12.1%	13.8%	14.8%	15.0%	14.9%	12.2%	11.5%	9.9%
Longmeadow	0.4%	0.4%	0.8%	1.9%	2.1%	1.9%	1.8%	1.3%	1.0%	1.0%	0.9%
Ludlow	0.1%	0.1%	0.8%	0.8%	0.5%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%
Middlefield	24.7%	26.7%	31.2%	22.1%	13.4%	14.1%	12.9%	12.0%	13.7%	17.0%	18.7%
Monson	0.4%	0.4%	0.2%	0.2%	0.9%	1.6%	1.7%	1.3%	1.3%	0.6%	0.0%
Montgomery	0.0%	0.0%	0.0%	1.6%	1.6%	2.6%	2.5%	2.8%	2.4%	3.0%	1.5%
Northampton	0.6%	0.5%	0.7%	0.9%	1.4%	0.9%	0.9%	0.7%	0.5%	0.1%	0.1%
Palmer	1.3%	2.1%	2.8%	1.5%	1.9%	1.9%	1.1%	1.1%	1.7%	1.7%	1.4%
Pelham	1.5%	1.4%	1.7%	0.7%	0.7%	4.1%	4.1%	3.9%	6.3%	6.3%	3.4%
Plainfield	17.1%	16.0%	18.1%	18.8%	#N/A	18.2%	19.3%	15.7%	16.8%	12.9%	11.9%
Russell	0.9%	0.8%	1.5%	3.1%	3.2%	2.6%	3.1%	1.7%	1.4%	1.4%	1.3%
South Hadley	0.8%	0.6%	0.8%	1.2%	1.5%	1.2%	1.4%	1.1%	0.8%	0.8%	0.6%
Southampton	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Southwick	1.5%	2.4%	2.6%	3.2%	2.5%	2.6%	2.6%	2.2%	1.5%	1.6%	0.8%
Springfield	0.1%	0.1%	0.3%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%	0.1%	0.2%
Tolland	63.3%	64.7%	59.4%	53.7%	54.2%	53.1%	51.4%	49.1%	51.0%	53.5%	55.8%
Wales	12.8%	12.0%	10.3%	9.4%	6.9%	8.0%	7.7%	8.2%	8.6%	8.9%	6.5%
Ware	1.1%	0.3%	0.9%	2.3%	2.7%	2.6%	2.5%	1.8%	1.6%	1.1%	0.8%
West Springfield	0.9%	0.9%	0.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%
Westfield	0.9%	0.7%	0.2%	0.4%	0.4%	0.6%	0.4%	0.5%	0.3%	0.4%	0.1%
Westhampton	10.3%	7.9%	8.3%	8.7%	10.6%	8.4%	9.0%	9.5%	8.9%	8.4%	10.6%
Wilbraham	0.0%	0.8%	1.7%	1.6%	1.8%	1.5%	1.4%	0.9%	1.0%	0.8%	0.7%
Williamsburg	0.0%	0.0%	0.4%	0.3%	0.4%	1.3%	1.5%	1.1%	1.9%	3.1%	2.2%
Worthington	7.6%	6.2%	8.9%	9.5%	12.6%	14.6%	12.1%	11.0%	11.9%	9.1%	9.1%

Source: U.S. Census Bureau

Table A5-40 – Building Permits for Single Family Homes

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hampden County	256	282	245	256	236	295	226	270	220	300	259	232
Hampshire County	121	144	163	164	169	240	215	222	158	170	158	124
Pioneer Valley Region	377	426	408	420	405	535	441	492	378	470	417	356
Agawam Town	19	16	18	11	12	16	31	19	8	16	20	27
Amherst town	8	9	8	11	10	11	10	25	24	10	6	5
Belchertown town	14	16	30	39	35	65	39	58	41	50	40	27
Blandford town	2	2	2	1	1	2	2	2	2	2	2	0
Brimfield town	17	19	5	4	7	6	9	9	9	9	10	8
Chester town	3	3	3	4	4	0	0	0	3	1	2	0
Chesterfield town	2	5	1	1	5	2	3	3	4	3	2	1
Chicopee	13	28	32	18	25	24	9	19	30	21	24	9
Cummington town	1	2	4	0	2	4	3	4	2	2	1	2
East Longmeadow town	14	14	18	33	30	32	0	0	0	31	32	14
Easthampton Town	6	7	14	7	11	12	11	11	11	11	2	1
Goshen town	2	3	3	1	0	0	1	2	2	1	0	0
Granby town	15	9	9	10	6	7	14	7	4	10	11	12
Granville town	6	1	2	0	2	2	0	0	2	2	1	1
Hadley town	10	4	10	4	3	22	20	25	7	8	14	13
Hampden town	1	2	7	5	0	0	9	3	4	5	0	5
Hatfield town	3	10	5	7	7	7	7	7	7	7	8	9
Holland town	1	1	2	1	1	0	2	3	1	1	1	1
Holyoke	3	11	7	2	2	3	1	5	4	3	0	3
Huntington town	1	1	2	2	2	4	4	2	2	2	3	4
Longmeadow town	1	5	5	4	1	3	4	0	3	1	0	2
Ludlow town	12	33	30	26	32	40	29	24	33	28	32	22
Middlefield town	2	2	0	0	2	2	4	5	4	4	1	2
Monson town	37	16	10	12	11	6	10	11	6	6	15	14
Montgomery town	3	1	0	0	0	1	1	1	1	1	3	4
Northampton	17	26	31	27	33	36	50	21	20	21	24	22
Palmer Town	1	1	1	1	1	5	6	8	5	8	9	6
Pelham town	0	0	1	1	0	1	2	1	1	0	0	1
Plainfield town	0	2	0	0	3	3	3	3	3	3	3	4
Russell town	0	0	0	0	1	1	1	1	2	2	2	1
South Hadley town	12	13	12	13	26	19	12	12	4	13	9	8
Southampton town	22	26	21	29	13	24	14	18	14	13	20	4
Southwick town	8	9	14	15	13	13	13	13	15	15	17	15
Springfield	55	53	27	39	44	79	4	63	4	77	3	24
Tolland town	0	0	0	2	2	6	5	3	1	0	3	4
Wales town	5	5	5	7	1	1	1	0	0	0	0	0
Ware town	2	2	5	5	1	8	8	8	0	0	0	0
West Springfield Town	27	20	14	10	6	12	17	14	17	7	8	6
Westfield	12	18	25	22	20	21	45	45	44	45	52	46
Westhampton town	0	2	3	2	2	4	5	7	1	7	7	5
Wilbraham town	16	24	18	39	20	22	27	27	26	19	23	20
Williamsburg town	1	1	0	1	5	5	4	3	3	3	3	4
Worthington town	3	4	4	4	3	4	1	0	4	2	4	0

Source: U.S. Census Bureau Building Permits Survey

CHAPTER 6 - SAFETY APPENDIX

A full listing of the bridges, railroad crossings, and regional dams was compiled for the PVPC region based on the best available data. This information is too large to include in a printed document. This data may be viewed and downloaded through the hyperlinks provided below. Printed versions of all three datasets are available on request from the Pioneer Valley Planning Commission.

Pioneer Valley Planning Commission
60 Congress Street
Springfield, MA 01104-3419

<http://www.pvpc.org>

(413) 781-6045

A. BRIDGES

Bridge information for the Pioneer Valley Region is available on the PVPC website at: <http://rtp24.pvpc.org/wp-content/uploads/2023/04/Appendix1Bridges.pdf>.

B. RAILROAD CROSSINGS

Railroad Crossing information for the Pioneer Valley Region is available on the PVPC website at: <http://rtp24.pvpc.org/wp-content/uploads/2023/04/Appendix2RailroadCrossings.pdf>.

C. DAMS

Regional Dam information for the Pioneer Valley Region is available on the PVPC website at: <http://rtp24.pvpc.org/wp-content/uploads/2023/04/Appendix3Dams.pdf>.