2. Introduction

2.1. Study Rationale

Community leaders, transportation stakeholders, and members of the public have expressed a desire for an enhanced passenger rail link among communities in western Massachusetts, central Massachusetts, and the Boston area. This desire reflects dissatisfaction with the multi-modal transportation options west of Worcester, which make Massachusetts communities west of Worcester reliant on motor vehicle travel via highways that are frequently congested east of Worcester. This can represent a significant barrier to travel from the western part of the Commonwealth.

In response to these issues and concerns, the 2018 Massachusetts State Rail Plan included a recommendation for evaluation of a "Western Massachusetts to Boston Passenger Rail Service Study." The East – West Passenger Rail Study, initiated by MassDOT in late 2018, represents the implementation of that recommendation.

Passenger rail service among the communities and attractions of western, central, and eastern Massachusetts could provide greater connectivity across the Commonwealth, enhance mobility, and create new economic development opportunities.

The East-West Passenger Rail Study:

- Identifies transportation corridors that provide new passenger rail connections between Pittsfield, Springfield, Worcester, Boston, and intermediate communities.
- Assesses the geographic, infrastructure, and demographic conditions in the East – West rail corridor.
- Evaluates potential improvement alternatives for enhancing passenger rail connections among the Corridor communities.
- Summarizes the projected benefits, costs, impacts, and trade-offs of the improvement alternatives.
- Was guided by an Advisory Committee.
- Identified potential Next Steps and Recommendations for consideration to advance a project.

MassDOT recognizes that a robust transportation system is essential to providing residents, businesses, and visitors with mobility to satisfy their economic, personal, and recreational needs. Passenger rail transportation can be an important component of a multi-modal transportation system that increases travel options and reduces greenhouse gas emissions.

Fast and frequent passenger rail service in the East-West Rail Corridor could enhance mobility and connectivity for Corridor communities, provide residents and stakeholders with additional travel options, and catalyze new economic opportunities, such as development around stations. Improved connectivity among job centers and better mobility for potential workers could increase employment opportunities for workers and expand the talent pool available to employers by better linking the western, central, and eastern regions of the Commonwealth with each other and with a broader travel market.

Massachusetts's railroad network provides passenger rail connections to much of the Commonwealth's population. MassDOT has undertaken efforts to restore and/or enhance Massachusetts Bay Transportation Authority (MBTA) commuter rail service to Boston, to "gateway" cities[1] and suburban communities throughout eastern Massachusetts. MassDOT has implemented significant improvements to service frequency and speed for the MBTA Framingham/Worcester and Fitchburg Commuter Rail Lines, and continues to advance restoration

of passenger rail service to Fall River and New Bedford through the South Coast Rail project.

At the same time, Springfield and surrounding areas have benefited from regional intercity passenger rail improvements, including the CTrail Hartford Line, Knowledge Corridor investments, and new services such as the Valley Flyer pilot.

Nevertheless, passenger rail connections from Springfield and Pittsfield to central and eastern Massachusetts remain limited to Amtrak's Lake Shore Limited. Decreased travel demand during the COVID-19 pandemic has led Amtrak to reduce the frequency of the Lake Shore Limited from one daily round trip to three round trips per week.

MassDOT is undertaking the East-West Passenger Rail Study to build upon other recent transportation system initiatives; to better understand the travel demand and needs in the Pittsfield – Springfield – Worcester – Boston corridor; and to develop strategies for improving access and enhancing economic and other opportunities for residents, businesses, and visitors in the Commonwealth. The outcome of this study will be a clearer assessment of the conceptual costs and impacts of enhanced rail service in the corridor, and MassDOT's conclusions regarding appropriate next steps.

Throughout the course of the study, a robust Civic Engagement process has involved residents, businesses, elected officials, and other key stakeholders. This process entailed public meetings, Study Advisory Committee meetings, briefings of business and community groups, and on-demand information provided through a project website.

2.2. Study Goals

Building upon this study context and rationale, MassDOT worked with the Advisory Committee, project stakeholders, and the public to identify the following project goals:

- Provide better **transportation options** to and from Western Massachusetts
- Support **economic development** throughout the East – West rail corridor
- Improve the attractiveness of Western Massachusetts as **an affordable place to live**
- Reduce the number of **automobile trips** along the corridor
- Reduce **greenhouse gas emissions** and **air quality impacts** from transportation

In developing and evaluating the study's alternatives, the improved transportation and mobility benefits achieved relative to these goals must be balanced against project costs and impacts. The major impact and cost elements to be considered include:

- Extent and severity of environmental and community impacts
- Potential impacts to rail-based freight and MBTA Commuter Rail operations
- Capital costs and operations and maintenance costs

These project goals and impact considerations have shaped the development of the study's alternatives, as well as the evaluation criteria that have been used in the Alternatives Analysis, discussed in Chapter 4.

[1] Massachusetts gateway cities are midsize cities facing socio-economic challenges that create obstacles to realizing their full potential. Three of the original eleven gateway cities are located in the East – West corridor: Pittsfield, Springfield, and Worcester.

2.3. Study Corridor

Implementation of an East – West passenger rail service requires a continuous, linear corridor that passes through the communities to be served. Without a continuous corridor, it would be impossible for trains to operate between stations. It is also important that the corridor provide an alignment that is straight enough to achieve speeds required for competitive passenger rail service, and wide enough to accommodate the railroad infrastructure needed to provide service.

The definition of the East – West rail corridor begins with identifying the communities to be served. The East – West Passenger Rail Study is intended to evaluate opportunities for providing passenger rail service among Pittsfield, Springfield, Worcester, and Boston, with the potential for service to intermediate communities.

An East – West rail corridor connecting these communities requires:

- A continuous corridor that can accommodate a railroad alignment with connections to the service communities
- Rail infrastructure, including tracks, signals, and other infrastructure that supports rail service
- Railroad stations within the service communities
- A service provider, governance structure, and funding

The East – West Passenger Rail Study addresses the first three requirements listed. First, the Massachusetts geography was reviewed to identify any potential linear corridors for connecting these service communities. Creating a new, dedicated transportation corridor for an East – West passenger rail service was considered and rejected. An entirely new transportation corridor would entail land acquisition needs that would have major residential, environmental, historic, and community impacts, which would render such a new corridor infeasible from both a practical and environmental permitting perspective, especially if existing linear corridors with lesser impacts are available. Fortunately, such existing corridors are available; these are generally existing east – west-oriented rail and highway transportation corridors. A corridor that would depend on a mixture of intercity bus and intercity rail was also rejected as contrary to the study's goals, particularly for the area west of Springfield.

Boston – Albany Rail Mainline

The Boston – Albany rail mainline corridor offers many advantages as a potential East – West passenger rail corridor. It provides a continuous linear corridor with existing railroad track, signal, and other ancillary infrastructure.

The Boston – Albany rail mainline provides connections to all service communities, including existing rail stations in all the major cities: Pittsfield, Springfield, Worcester, and Boston. West of Worcester, the rail corridor is owned by CSX Transportation, the third-largest North American freight railroad (by 2019 revenues) and the largest freight railroad operating in New England. East of Worcester, the rail line is owned by the Commonwealth of Massachusetts.

The Boston – Albany corridor traverses a succession of north-south river systems and an ascent through the Berkshire Mountains. The challenging topography required the builders to follow an alignment with multiple sharp curves to maintain reasonable gradients that were within the capabilities of 19th Century construction methods. This presents challenges to operating a higher-speed passenger rail service.

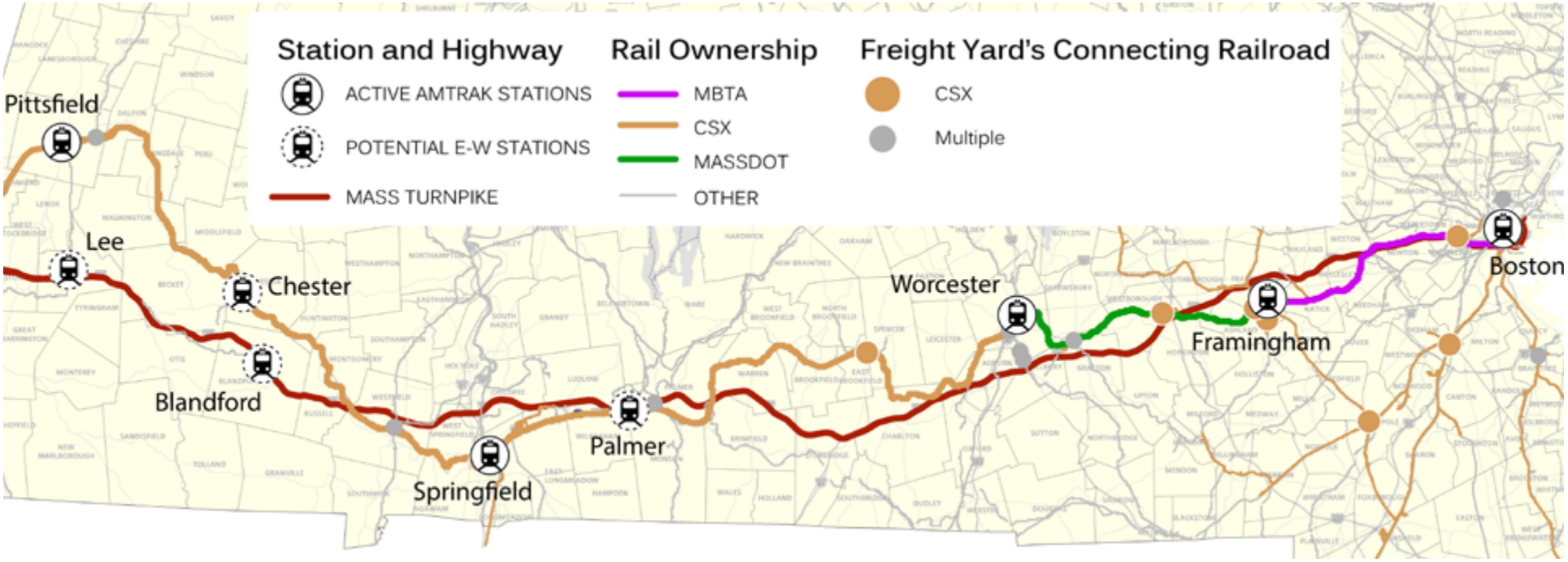
Interstate 90/Massachusetts Turnpike

The second corridor that was identified as having potential for accommodating East – West passenger rail service is along the Interstate 90/Massachusetts Turnpike (I-90) corridor. This corridor

provides many advantages for accommodating an East – West rail alignment. It is a continuous linear corridor that is already owned by the Commonwealth of Massachusetts. In addition, it is generally wider and straighter than the Boston – Albany rail mainline, which could enable the creation of a lower-curvature, higher-speed rail line. Figure 2-1 shows ownership and freight terminals along the existing rail corridor, as well as the alignment of the Massachusetts Turnpike.

However, use of the I-90 corridor for a rail line would also present several challenges. The Massachusetts Turnpike is a grade-separated expressway, with many bridges that carry the highway over or under roadways that cross it. A new railroad line would have impacts on these bridges, as well as on highway access ramps. In addition, the I-90 corridor climbs steeper grades that automobiles and trucks can navigate, but that are more difficult for trains. This would require infrastructure – either elevated viaducts or excavated depressed segments – in numerous locations in order to create grades that trains can traverse. The I-90 corridor is also severely space-constrained in some segments, in particular the section of the highway from downtown Boston to Route 128/Interstate 95. The I-90 corridor also does not provide direct connections to downtown Pittsfield, Springfield, or Worcester, and would require supplemental connections using new access alignments to those destinations.

Figure 2-1 – Railroad Ownership, Existing and Potential Passenger Stations, and Relevant Freight Rail Terminals



Northern Tier/Patriot Corridor – Fitchburg Line

Another corridor that was reviewed for the potential to accommodate East – West rail is the so-called "northern tier" rail corridor. This corridor generally parallels Route 2 in the northern portion of Massachusetts. It comprises two principal segments: west of Fitchburg, the "Patriot Corridor" freight rail line; east of Fitchburg, the MBTA Fitchburg Line commuter rail provides connections for 18 stations to Boston's North Station. This corridor was not pursued as a viable East – West connection because it does not provide direct or proximate rail connections to Springfield or Pittsfield, two of Massachusetts' original gateway cities. While adding a new rail service along either the Boston – Albany mainline or the "northern tier" rail corridor would increase passenger rail service through gateway cities already served by MBTA Commuter Rail another original gateway city, Greater Worcester represents a larger market than Fitchburg-Leominster.

2.4. Study Context

The potential for implementation of a passenger rail service in the East – West corridor is informed by many previous, ongoing, and future transportation projects and planning studies. The following section summarizes the relevant projects and studies that have significant bearing on the analysis and assumptions of the study, along with the key issues that pertain to the evaluation and potential implementation of the East – West Passenger Rail project.

Northern New England Intercity Rail Initiative (NNEIRI). The NNEIRI study is an important predecessor to the East – West Passenger Rail Study. NNEIRI completed a planning and environmental review of passenger rail in New England, with a study area that included the Boston – Springfield segment of the East – West study corridor.

The states of Massachusetts, Connecticut, and Vermont collaborated with the Federal Railroad Administration (FRA) to evaluate the potential for a safe and efficient intercity passenger rail system that seamlessly links major cities in New England. To advance this vision, the NNEIRI study evaluated infrastructure and service improvements for providing high-speed passenger rail for connections between Boston and Montreal, Boston and New York, and New York and Montreal. This study included the segment of the East – West Corridor between Springfield and Boston along the Inland Route, as shown in Figure 2-2.

Figure 2-2 – Northern New England Intercity Rail Initiative (Credit: NNEIRI)

In 2016, the NNEIRI study completed a Tier 1 Environmental Assessment (EA) through the National Environmental Policy Act (NEPA). The NNEIRI Tier 1 EA assessed corridor-level benefits and impacts. It included an Alternatives Analysis and a Service Development Plan, which provided evaluation of three alternatives with a range of improvements, costs, speeds, and frequencies. Alternatives with speeds greater than 90 mph were not advanced due to right-of-way constraints. As a result, the best travel time for NNEIRI alternatives was 1:49 between Boston and Springfield. Based on the EA, the Federal Railroad issued a Finding of No Significant Impact (FONSI), which determined that the project would have no significant environmental impacts and could move forward without an Environmental Impact Statement. The next phase of review would be a Tier 2 NEPA review, which would investigate more detailed project-level benefits and impacts.

Relevant Projects and Studies Assumed to be Operational Prior to East – West Implementation. Since the publication of NNEIRI in 2016, significant infrastructure improvements have been completed or are being actively pursued along key Corridor segments, which could be beneficial for increased passenger rail service, particularly between Worcester and Boston and in Springfield. In addition, several other projects and initiatives have been completed and other significant infrastructure improvements have been studied but not yet funded or implemented. Because the following projects and services are either complete or well advanced in the project development and environmental process, they were assumed to be operational as part of the "future baseline" condition for the study analysis.It should be noted that construction of these projects, including South Station Expansion, were assumed in the future baseline condition even though they are not currently funded projects; their costs are not included in the East – West Passenger Rail Study's conceptual cost estimates.

Completed Studies and Projects

- **New Haven – Hartford – Springfield (NHHS) Program (CTrail Hartford Line):** In Connecticut, a robust regional rail service between New Haven, Hartford, and Springfield was inaugurated in 2018 via the NHHS High-Speed Intercity Passenger Rail (HSIPR) Project. The improvements increased maximum permitted speeds to 110 miles per hour (mph), reduced travel times and conflicts with freight trains along shared segments, and increased frequencies from 6 to 16 daily round trips in addition to the St. Albans to Washington, DC Vermonter Service operating the route.
- **Springfield Union Station Improvements:** In early 2020, MassDOT completed a major component of its long-term improvement program for Springfield Union Station. The installation of a new full-length, high-level Platform C enables the terminal to accommodate five-car trainsets and provide ADA-compliant level boarding.

Ongoing Studies and Projects

- **Knowledge Corridor:** In western Massachusetts, passenger service along the Connecticut River Line, which provides access to Greenfield, Northampton, and Holyoke en route to Springfield, was restored in 2014 after significant corridor rehabilitation. This alignment provided Amtrak's daily Vermonter Service with a more direct route between Brattleboro and Springfield. The Knowledge Corridor also currently provides service on the Valley Flyer; this two-year pilot service, which began in August 2019, is operated by Amtrak and provides two daily round trip trains between Greenfield, MA and New Haven, CT. It operates as an extension of Amtrak Hartford Line trains and provides service to the following station stops in Massachusetts: Springfield, Holyoke, Northampton, and Greenfield. The pilot service demonstration period occurred during the COVID-19 pandemic which could modify the evaluation criteria to reflect the impact to travel demand.

- **Worcester Triple Tracking Study:** The construction of 10 miles of new triple track rail sections between Route 128 and Framingham would improve rail line capacity and enable express trains and those with limited stops (such as the MBTA's Heart to Hub, Amtrak's Lake Shore Limited, and a new East – West Passenger Rail service) to bypass local commuter rail traffic. As shown in Figure 2-3, the project would entail moderate track realignments and major upgrades to signals, stations, bridges and highway grade crossings, and new interlockings as well as construction of the new 3rd mainline track. This project is not currently funded for construction.
- **Worcester Union Station Improvements:** As recommended in the NNEIRI study, the development of a new center island platform would increase operational capacity at Worcester Union Station for existing and future passenger services, including a potential East-West service, by allowing multiple trains to serve the terminal at once. In addition, the project includes new passenger connections to the station and parking, as well as track and signal upgrades. This project recently completed the design phase. This project is not currently funded for construction.
- **South Station Expansion (SSX)**: Boston's South Station is capacity-constrained, and expanding the station is a priority for increasing rail service to downtown Boston. The proposed expansion project would provide seven new tracks and four new platforms, as well a significant reconfiguration of existing track infrastructure, platforms, train layover facilities and passenger waiting spaces. MassDOT has completed environmental review and is advancing early action elements of the project. This project has been assumed operational for the purpose of analysis for East – West Passenger Rail service, but the full build is not currently funded.

Figure 2-3 – Recommendations from the MBTA's Worcester Triple Tracking Study

- **Worcester Line Positive Train Control (PTC) Upgrades:** By preventing trains from exceeding authorized speeds (including work zones) or colliding, PTC provides additional operational safety features. The MBTA has implemented PTC for the existing train control system along its Worcester Line from Boston to Worcester and is scheduled to complete work by December 30, 2020. CSX is implementing PTC from Worcester to Springfield and Pittsfield.

Other Potential Projects. The projects above are assumed to be part of the future condition that needs to be in place before an East – West Passenger Rail project could be implemented. In addition, there are several other potential projects that are less developed and have less certainty about their final configuration and likelihood of implementation.

While these projects have the potential to affect passenger rail services along the Corridor, they are not assumed to be in place as part of the East – West Passenger Rail baseline condition, and the successful operation of the East – West Passenger Rail service is not dependent upon their completion. Nevertheless, their key elements are summarized below.

- **Amtrak Northeast Corridor (NEC) Future:** This comprehensive study recommended integrating frequent service between Springfield and New Haven via the Hartford Line into Amtrak's future operations portfolio for the Northeast Corridor. NEC Future contemplated a dramatic increase in intercity trains serving Springfield by 2040, moving from a 2014 total of two daily trains to 35, with four Intercity and two Regional peak hour trains.
- **MBTA Rail Vision:** The MBTA undertook a comprehensive review of its Commuter Rail network to identify opportunities for significantly enhancing the system's transit capacity and access. After assessing a broad range of long-term infrastructure and service investment scenarios, the MBTA Fiscal Management and Control Board endorsed the study's "full transformation" alternative. This option includes the electrification of the lines, expansion of the train fleet, and improvements to stations and rail lines. These upgrades could allow 15-minute service all day for "Inner Core" stations closer to Boston and at major "Key Stations" like Worcester.
- **MassDOT Allston Multimodal Project:** This project could rehabilitate the deteriorating Massachusetts Turnpike/Interstate 90 (I-90) viaduct and interchange in Boston's Allston neighborhood. The project is also expected to realign the highway, create new urban development opportunities, and enhance the multimodal transportation infrastructure in the area with a new layover facility for MBTA Commuter Rail, a new transit center (West Station), and improved track infrastructure. The expanded midday train layover facility, this project could divert some trains from South Station and relieve track congestion, which could provide additional terminal capacity for facilities could benefit servicing future East-West passenger trains.

2.5. Civic Engagement

The East-West Passenger Rail Study has entailed a comprehensive civic engagement process involving residents, the study's Advisory Committee, and other stakeholders in a series of meetings and through online interaction.

Advisory Committee. MassDOT developed an Advisory Committee consisting of individuals representing diverse perspectives from Pittsfield to Boston. The members include:

- Owners/operators along the corridor
- Legislative officials
- State officials
- Regional planning agencies
- Key municipalities
- Business groups

The Advisory Committee provided jurisdictional, policy, technical, and administrative input in advance of major decisions. Table 2-1 lists the members of the committee. In addition to participating in meetings, the Advisory Committee members also provided written comments on alternatives. They had a significant role in narrowing a wide range of options for improving mobility to six and then to three Final Alternatives for analysis.

The Advisory Committee met six times: in December 2018; July 2019; two meetings in February 2020; and online meetings in June and September 2020; these last two meetings were held online due to COVID-19 pandemic restrictions on public gatherings. Presentations were shared at each meeting and posted on the project website. Participating members of the public were also able to provide feedback, questions or comments at each Advisory Committee meeting.

Table 2-1 – Advisory Committee Members

NAME	ORGANIZATION
Todd Bailey	Baystate Health
Rep. Natalie Blais	MA State House of Representatives
Sen. Joseph A. Boncore	MA State Senate
Jonathan Butler	1Berkshire
Patrick Carnevale	Western Massachusetts Office of the Governor
Sen. Harriette L. Chandler	MA State Senate
Sen. Jo Comerford	MA State Senate
Nancy Creed	Springfield Regional Chamber
Rep. Mindy Domb	MA State House of Representatives
Marc Draisen	Metropolitan Area Planning Council
Linda Dunlavy	Franklin Regional Council of Governments
Astrid Glynn	MassDOT
Daren Gray	Baystate Health
Richard Griffin	MassDevelopment
John Hahesy	Massachusetts Association of Railroads
Sen. Adam Hinds	MA State Senate
Bill Hollister	Amtrak
Mayor Donald Humason	Westfield
Linda Leduc	Town of Palmer
Sen. Eric Lesser	MA State Senate
Paul Matthews	Worcester Regional Research Bureau
Thomas Matuszko	Berkshire Regional Planning Commission
Rep. Jim McGovern	US Congress
Rep. Seth Moulton	US Congress
Rep. Richard Neal	US Congress
Melissa Olesen	Office of Senator Edward J. Markey
Rep. Alice Hanlon Peisch	MA State House of Representatives
John Perez	Minority Business Council - Springfield Regional Chamber
Rep. Thomas M. Petrolati	MA State House of Representatives
Mayor Joseph Petty	City of Worcester
Janet A. Pierce	Central MA Regional Planning Commission
Rep. Smitty Pignatelli	MA State House of Representatives
Jody Ray	MBTA Commuter Rail
Kimberly H. Robinson	Pioneer Valley Planning Commission
Rep. Lindsay Sabadosa	MA State House of Representatives
Mayor Domenic J. Sarno	City of Springfield
Peter Schwartz	Federal Railroad Administration
Sandra Sheehan	Pioneer Valley Transit Authority
Rep. Todd Smola	MA State House of Representatives
Rick Sullivan	Western Massachusetts EDC
Tonia Tassinari	MA Dept. of Housing & Economic Development
Jeremy Thompson	495/MetroWest Partnership
Mayor Linda M. Tyer	City of Pittsfield

Public Meetings. MassDOT hosted three public meetings at key points in the process to share the information collected to date and gather ideas and comments from the public.

The first meeting, in March 2019, introduced the Study process and factors in the analyses. It included an open house with presentation boards that provided information on potential riders; employment along the corridor; speeds and travel times; physical conditions; other operators; a range of service alternatives; and examples in other corridors.

The second meeting was in February 2020. The main topic was the Alternative Analysis, including evaluation criteria, ridership methodology, the Alternatives Analysis, and questions and discussion. In addition to the Advisory Committee and first public meeting input, MassDOT received 75 emails commenting on these goals.

A third public meeting occurred in October 2020. This final meeting offered a review of the three Final Alternatives selected and a discussion of evaluation results, including costs, environmental and community impacts, and the Benefit-Cost Analysis.

All meetings offered accessible and multi-linguistic meeting materials consistent with MassDOT requirements. The virtual meetings, held in response to COVID-19 pandemic meeting restrictions, offered closed captioning and Spanish interpretation. Virtual meetings were recorded through an online webconferencing platform and posted on the project website.

Briefings. The East-West Study team also briefed members of the legislature, interested stakeholders, and Regional Planning Agencies on the Study.

- Legislative briefings were held in October 2018, July 2019, and October 2020
- Regional Planning Agency presentations and discussions took place in October 2018, July 2019, February 2020, and September 2020
- Study team members responded to requests for information throughout the study process and prepared technical memos

Website and Communication Materials. MassDOT created the East-West Passenger Rail Study website to define the Study, post meeting minutes and presentations, and invite stakeholders to sign up for email posts on the project or send questions to the project team. All of the Study presentations are posted on the site, as well as the project fact sheet in English and Spanish, upcoming events and additional resources. The fact sheet provided detailed information about the Study schedule, corridor, alternatives development and analysis. Stakeholders and interested parties were invited to sign up for project updates, meeting notices and meeting summaries. As of September 2020, there were 1,270 subscribers. Advisory Committee members and the public frequently provided comments, questions and preferences through the website contact information.

Civic Engagement Input. Throughout the study process, Advisory Committee members, Corridor residents, and study stakeholders have articulated a strong desire for better connections between western, central, and eastern Massachusetts. Advisory Committee members and other stakeholders have provided input on anticipated benefits from an East – West Passenger Rail service for residents and businesses throughout the corridor, including:

- Western Massachusetts – Provide passenger rail connections to opportunities in central and eastern Massachusetts, including jobs, recreational opportunities, and important regional assets like Logan Airport, Boston's hospital and healthcare cluster, educational institutions, and entertainment/recreational destinations such as Fenway Park and the TD Garden
- Eastern Massachusetts – By providing more frequent and reliable rail service, enable workers with jobs in eastern Massachusetts to have access to less expensive housing in central and western Massachusetts, while providing employers with access to a larger pool of potential employees
- Full Corridor – Divert automobile trips from I-90 and provide congestion-relief benefits while reducing climate and air quality impacts

These priorities from the Advisory Committee and the study's Civic Engagement process, combined with the study's rationale and goals, guided the evaluation of Existing Conditions discussed in Chapter 3, as well as the development and evaluation of improvement alternatives discussed in Chapter 4. Key findings from the study's alternatives analysis are detailed in Chapter 5, and in consideration of input from the study's public engagement process, MassDOT's Next Steps and Recommendations are included in Chapter 6.