



Northern Tier Passenger Rail Study

Public Information Meeting #2

October 26, 2023



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Agenda

- 1 Study Overview
- 2 Public Workshop Review
- 3 Phase 2 Alternatives Development and Evaluation
- 4 Public Comment
- 5 Next Steps



Study Overview

Study Overview

- Study initiated at the direction of the Massachusetts Legislature to conduct a feasibility study of rail access between the cities of North Adams and Boston
- Conceptual planning study to examine economic and environmental benefits, and identify all necessary improvements and any challenges



Study Process



The steps in **bold** represent the current stage of the study process

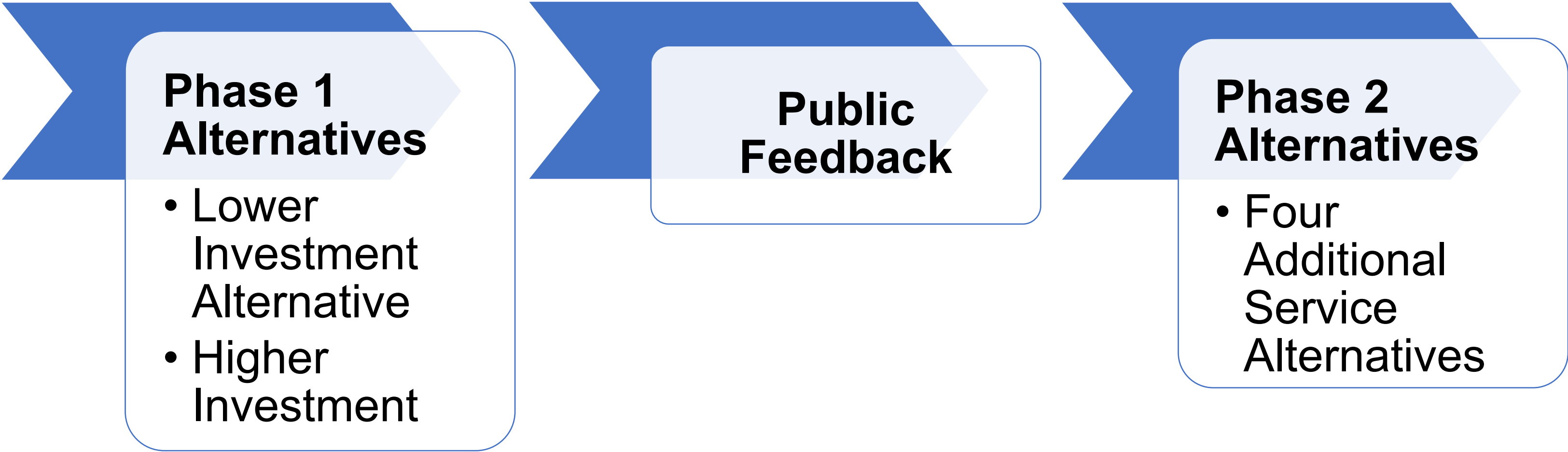
Study Goals and Objectives

- **Goal: Support economic development along the Northern Tier corridor**
 - Improve connectivity and access to destinations (e.g., jobs and services, academic institutions, tourist attractions, etc.)
 - Support the advancement of relevant economic development-related policies, plans, and designations
 - Minimize impacts to freight rail operations
- **Goal: Promote transportation equity**
 - Increase mobility options between Western and Eastern Massachusetts
 - Improve connectivity and reliability
 - Enhance safety
- **Goal: Minimize impacts on public health and the environment from transportation**
 - Improve public health outcomes
 - Minimize air/noise pollution and greenhouse gas emissions
 - Minimize or avoid impacts to cultural or natural resources



Public Workshop Review

Two-Phase Alternatives Development Process



Phase 1 Service Alternatives Recap

Common Attributes	Lower Investment & Higher Investment Alternatives
Service Type	One-seat ride from North Adams to Boston North Station
Number of Stations	4 (North Adams, Greenfield, Fitchburg, Boston North Station)
Frequency	5 trains daily (1 AM peak, 2 midday, 1 PM peak, 1 evening)
Schedule Times	Schedule times selected for trip purposes; secondary bias toward connection with North-South Service at Greenfield
Other uses of ROW	Assumes commuter schedules and freight trains
Dwell Time at Stations	2 minutes (Amtrak Scheduling Standard)
Equipment Type	Diesel trains with Amfleet passenger cars and same consist as Valley Flyer
MBTA Infrastructure	No modification to MBTA infrastructure

Unique Attributes	Lower Investment	Higher Investment
Track Infrastructure Improvements	Limited to signal improvements (including PTC) and upgrade of Class 1 track at PAS East Deerfield Freight Yard; some trackage additions to support meet-pass locations; no change in superelevation on PAS corridor	More track rehabilitation and improvements to support superelevation and increase in track class to fully use capability of the train to match superelevation; some trackage additions to support meet-pass locations

Phase 1 Service Alternatives – Initial Evaluation

Evaluation Criteria	Lower Investment	Higher Investment
Coverage Area and Populations Served	North Adams, Greenfield, Fitchburg and Boston North Station	North Adams, Greenfield, Fitchburg and Boston North Station
Environmental Impacts	Minimal potential environmental impacts	Minimal potential environmental impacts
Passenger Rail Impacts	Not expected to impact MBTA operations	Not expected to impact MBTA operations
Travel Times	3 hours 55 minutes eastbound 3 hours 59 minutes westbound	2 hours 48 minutes eastbound 2 hours 58 minutes westbound
Economic Impacts	\$1,248,000 to \$3,293,000 transportation cost savings 2,964 construction jobs (year 1) \$424,000,000 construction output (year 1)	\$1,932,000 to \$5,193,000 transportation cost savings 4,912 construction jobs (year 1) \$714,000,000 construction output (year 1)
Cost Effectiveness	\$7,358,100 capital cost per mile \$18,735 to \$49,472 capital cost per rider \$215 to \$568 annual operating cost per rider	\$15,403,875 capital cost per mile \$27,390 to \$73,107 capital cost per rider \$150 to \$401 annual operating cost per rider
Freight Rail Impacts	10 minutes of average freight delay estimated	10 minutes of average freight delay estimated
Annual VMT Reduction	-2,313,821 to -6,105,127	-3,754,257 to -10,128,225

Public Workshop Feedback – Phase 2 Alternatives

Consider additional
stops

(e.g., Shelburne Falls,
Athol/Orange, Gardner,
Porter Square)

Evaluate a connection
to Albany

Consider seasonal
attractors

Consider potential
upgrades to support
higher speeds

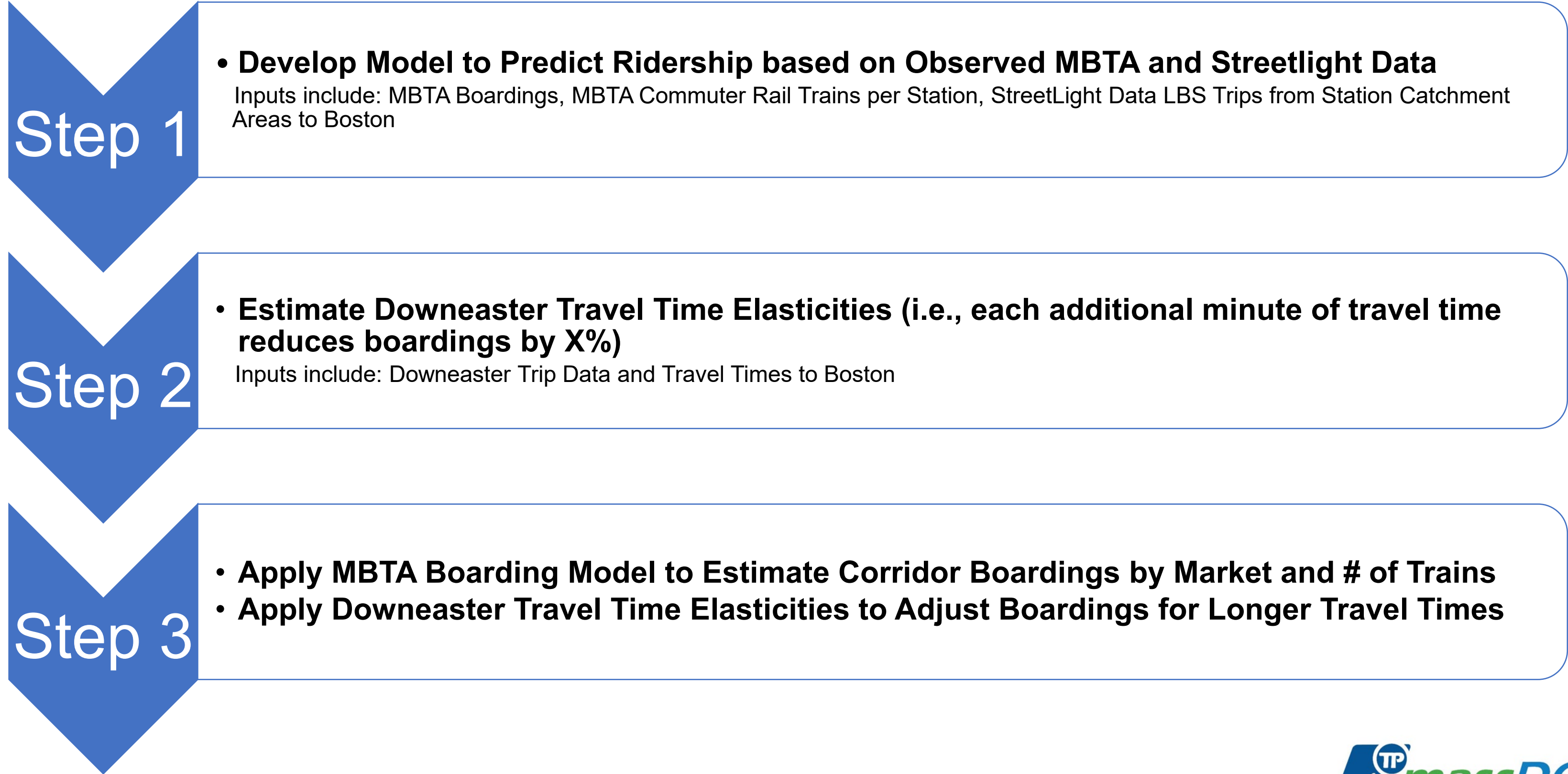
Public Workshop Feedback – Comments/Questions

Ridership
Projections

Cost Estimation

Public Workshop Feedback – Clarifications: Ridership

Initial Ridership Estimation Process



Public Workshop Feedback – Clarifications: Ridership

Updated Ridership Estimation Process

Step 1

- **Develop Model to Predict Ridership based on Observed MBTA and Streetlight Data**
Inputs include: MBTA Boardings, MBTA Commuter Rail Trains per Station, Ratio of Transit to Auto Travel Time, StreetLight Data LBS Trips from Station Catchment Areas to Boston

Step 2

- **Estimate Headway Elasticities (i.e., each additional trip increases boardings by X%)**
Inputs include: Peak period and daily passenger rail trips on the Northern Tier

Step 3

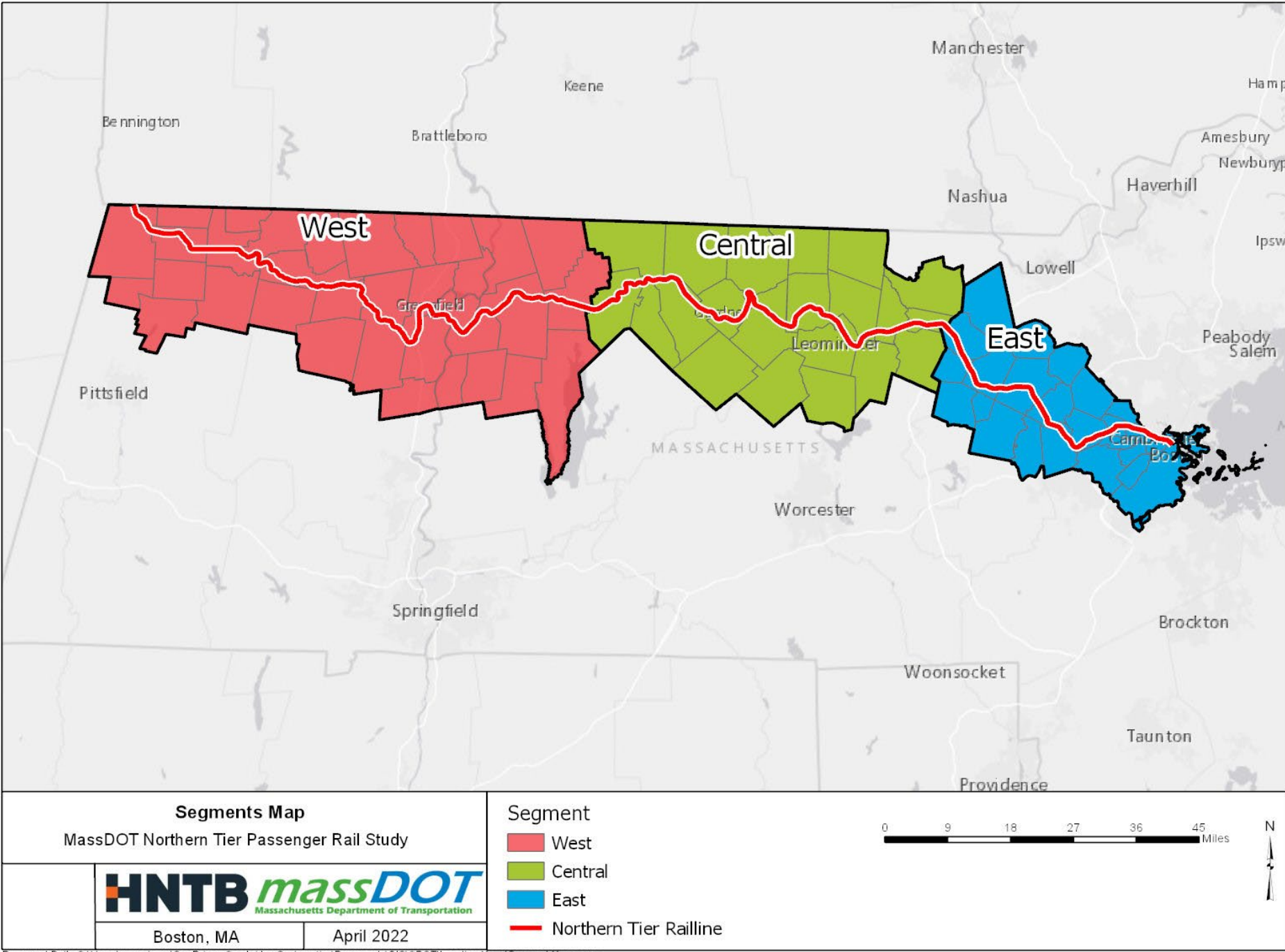
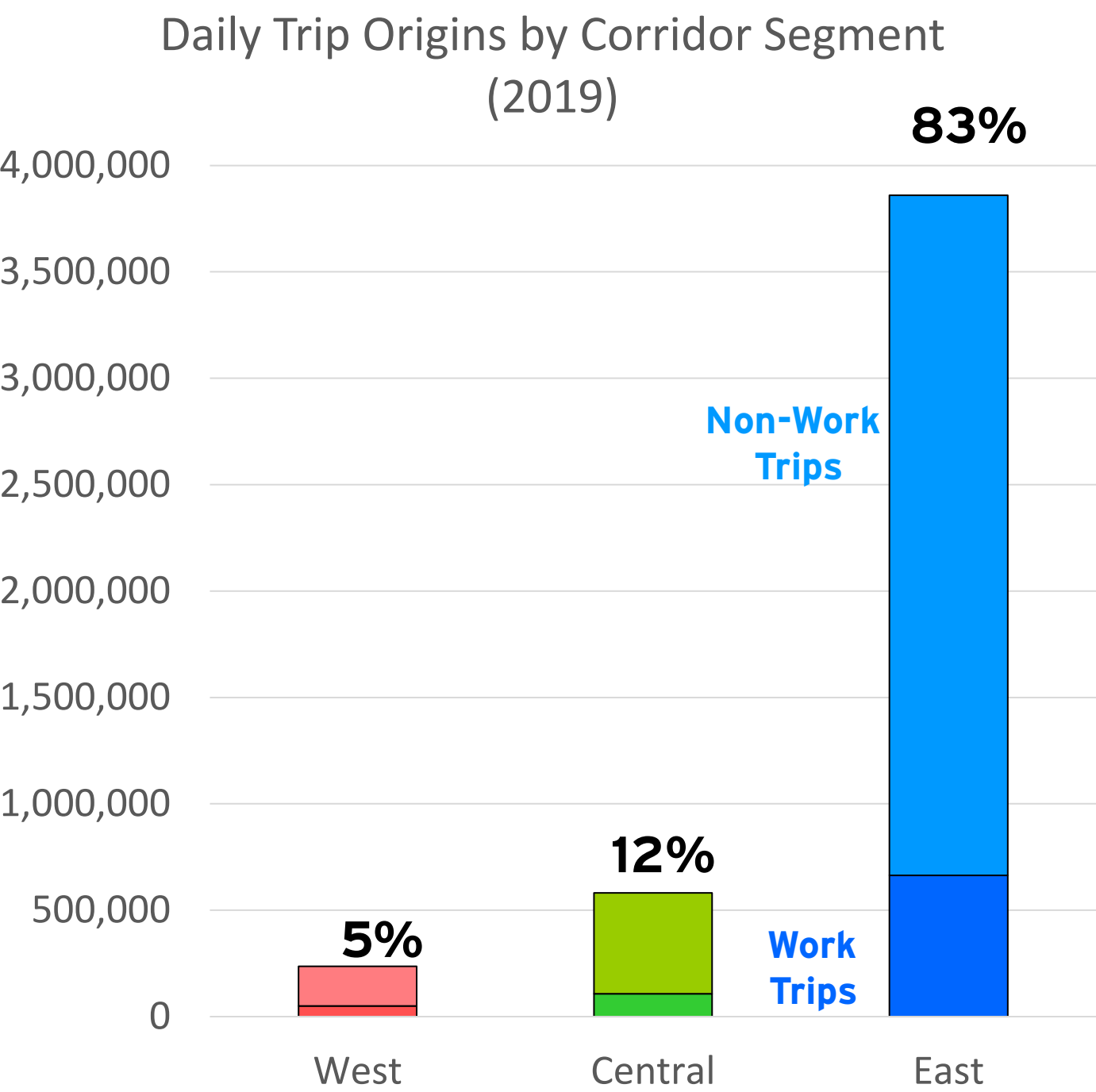
- **Apply MBTA Boarding Model to Estimate Corridor Boardings by Market and # of Trains**
- **Apply Rail vs. Auto Travel Time Elasticities to Adjust Boardings**

Step 4

- **Apply recent travel patterns for Intra-Corridor trips on the Downeaster to estimate non-Boston based travel along the Northern Tier Corridor**

Public Workshop Feedback – Clarifications: Ridership

Overview of Travel Purpose in the Corridor

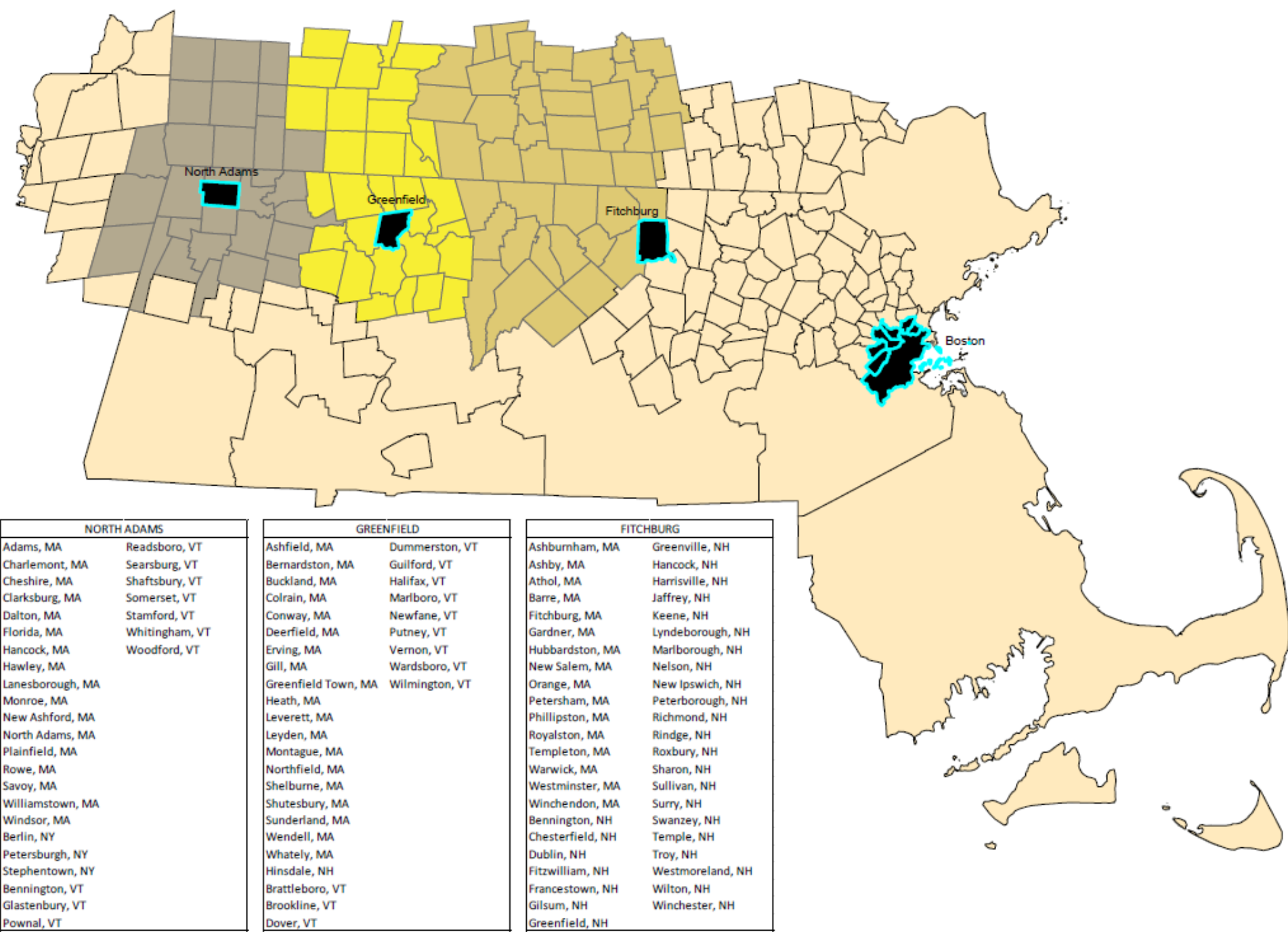


Source: Streetlight Data, 2019

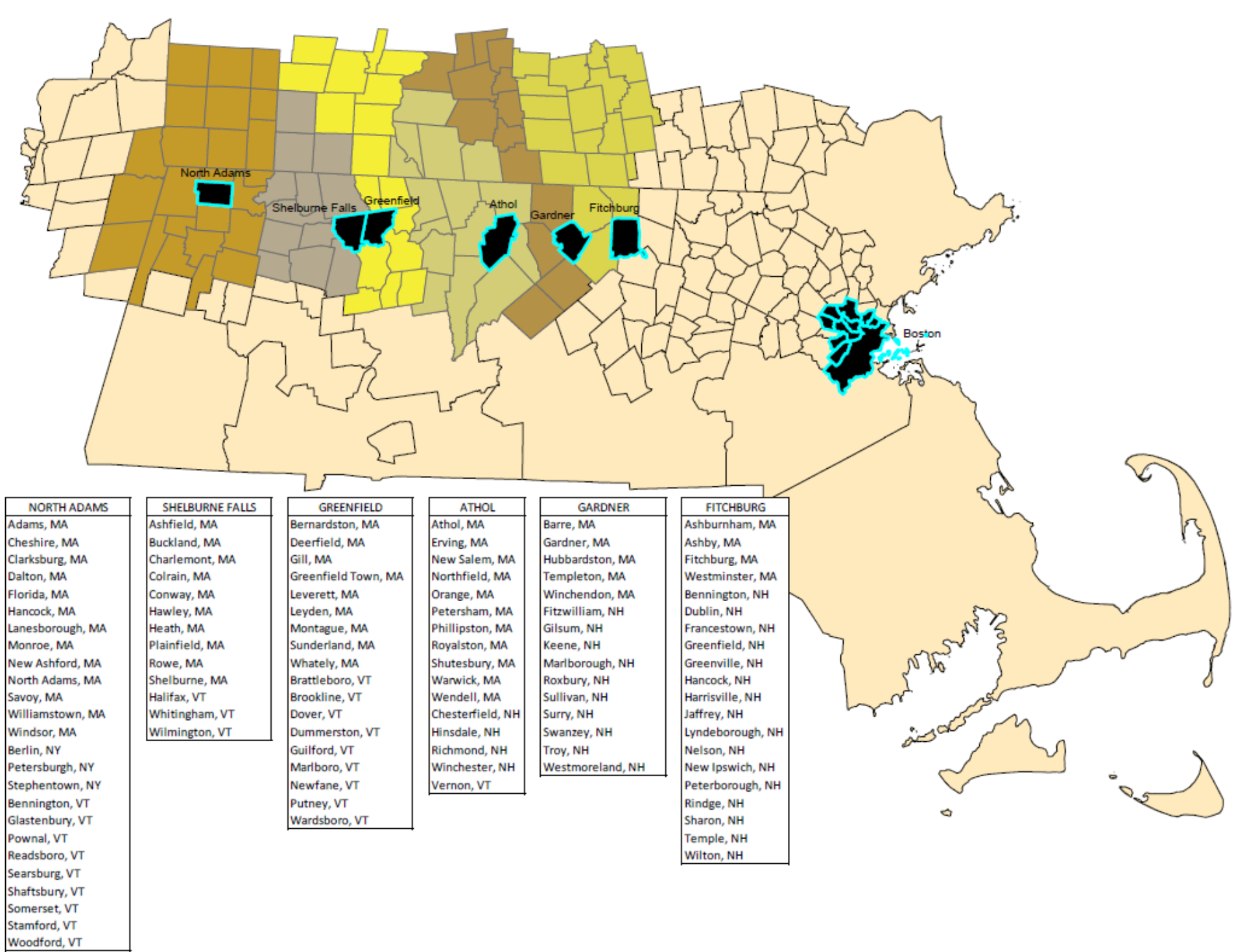
Public Workshop Feedback – Clarifications: Ridership

Station Catchment Areas for LBS Trips

Stations in Phase A Alts



Effect of Added Stations

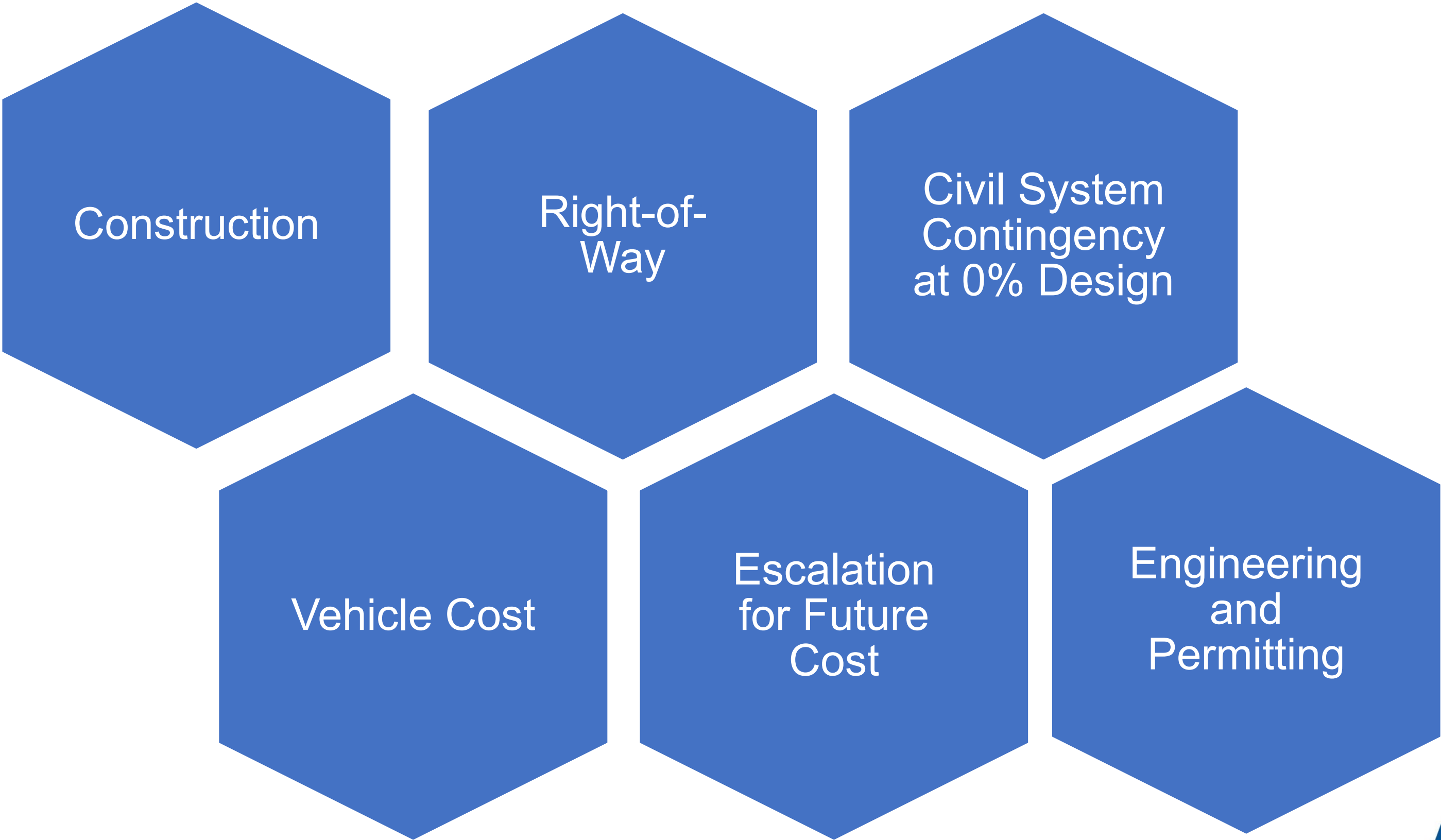


Public Workshop Feedback – Clarifications: Cost Estimation

- Cost estimation is the process of forecasting the cost of building an infrastructure project
 - Considers factors such as materials, location, equipment, and labor
 - Process depends upon level of design
- Northern Tier is at pre-design stage
 - Contingency costs account for unknown, but expected elements of the project
- Cost estimates are based on material, equipment, and labor costs from recent railroad construction projects in Massachusetts and surrounding states

Public Workshop Feedback – Clarifications: Cost Estimation

Cost Categories



Public Workshop Feedback – Clarifications: Cost Estimation

- Costs of track components were refined
- The typical practice of recycling rail was incorporated
- Rolling stock estimates were updated with new assumptions on consists and recent rolling stock purchases
- Station estimates reflect accessible station features



Phase 2 Alternatives Development and Evaluation

Proposed Phase 2 Service Alternatives

- Based on input received on the two initial alternatives, four additional service alternatives are proposed:

Alternative 3 – Electrified Service

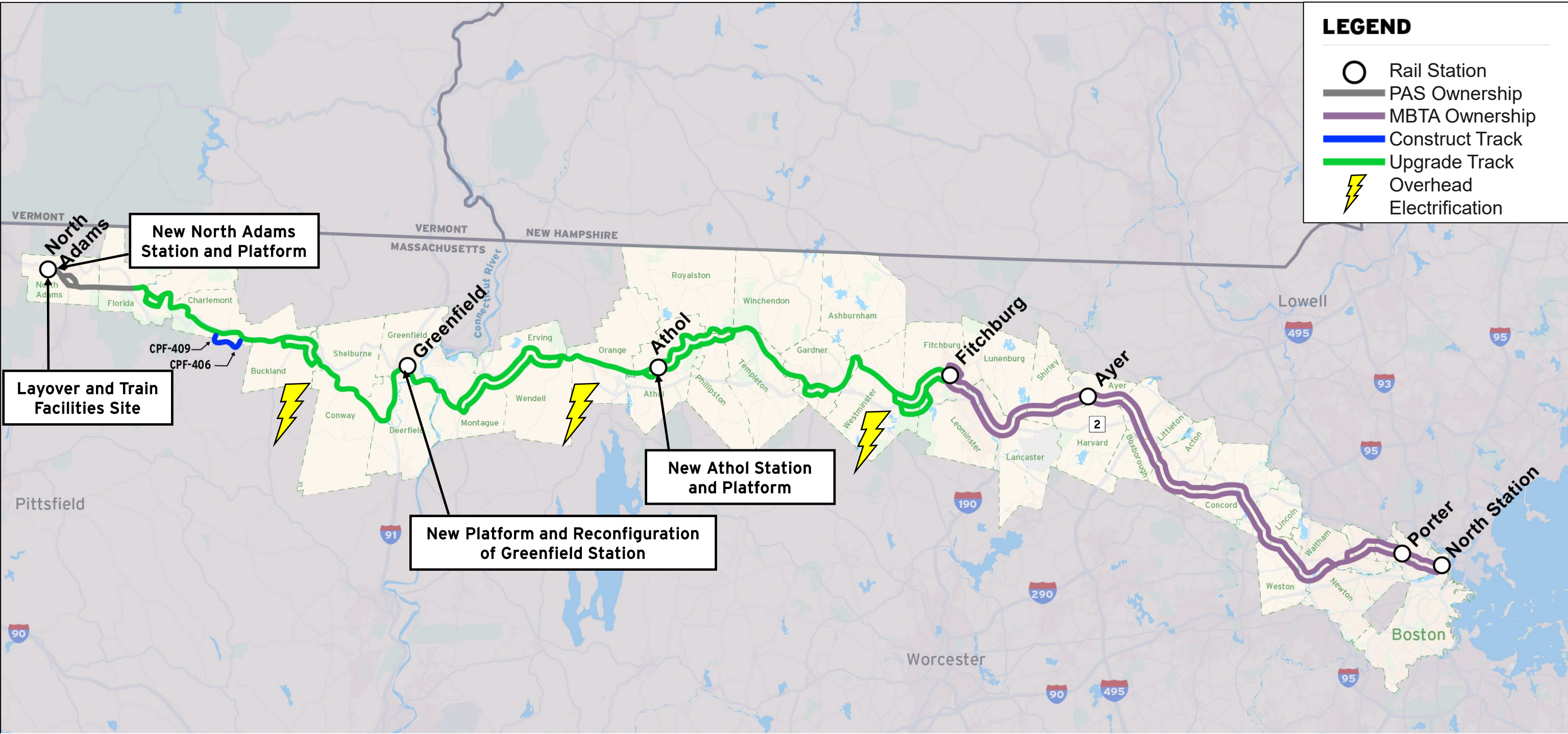
Alternative 4 – Full Local Service

Alternative 5 – Albany Extension

Alternative 6 – Northern Tier Rail Link

Proposed Phase 2 Service Alternatives

Alternative 3 – Electrified Service



Service Type

- 5 Trains/day
- All Stops

Stations

- North Adams
- Greenfield
- Athol
- Fitchburg
- Ayer
- Porter
- North Station

Proposed Improvements

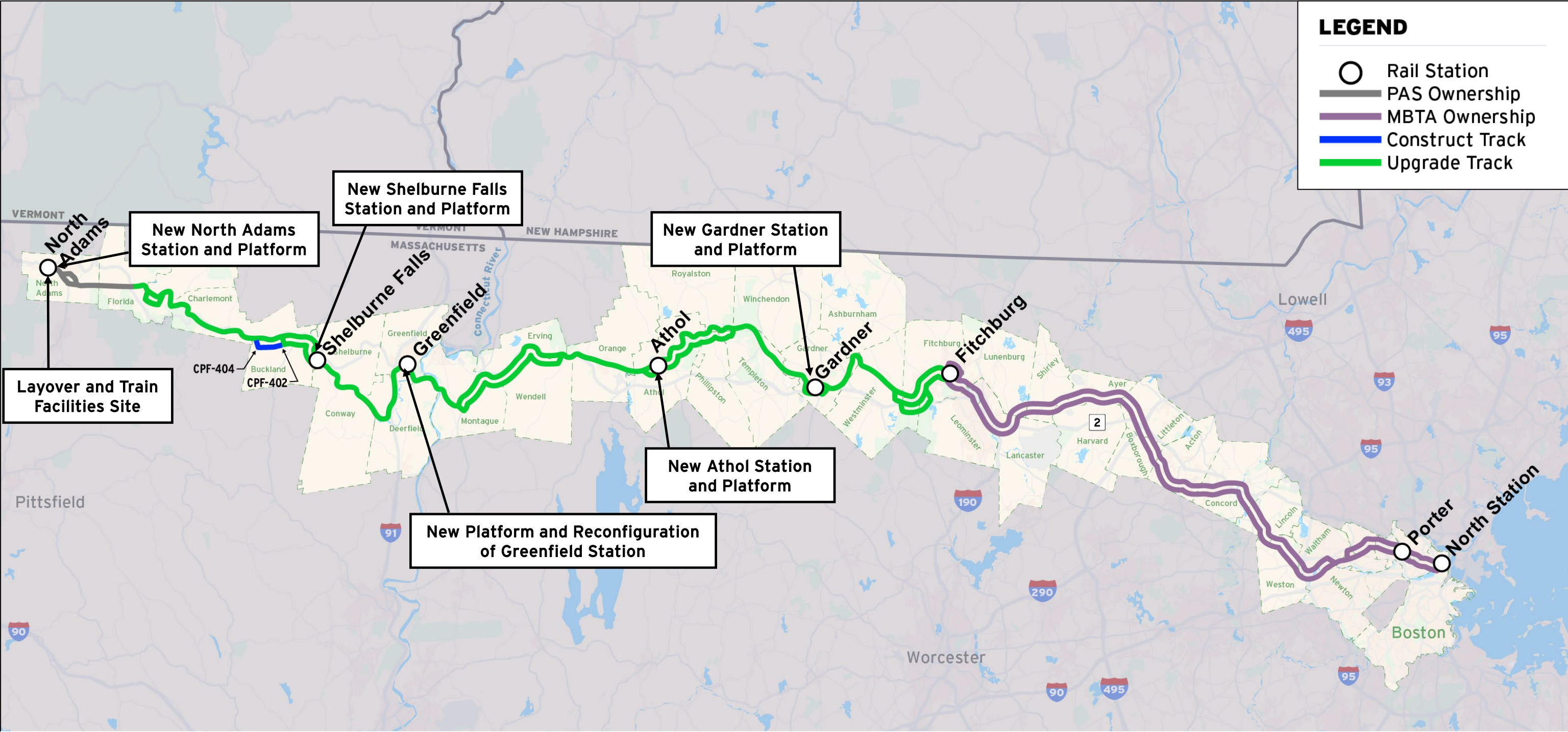
- New double track in Charlemont
- Track upgraded to Class 3 and 4
- Overhead electrification
- Crossing renewals
- Bridge rehabilitation
- Signal replacement & Positive Train Control
- North Adams layover

Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
\$876,805,373	\$429,711,003	\$141,368,789	\$1,325,887,659	\$34,669,646	\$15,969,632	\$102,087,316	\$2,926,449,410

Cost of electrification for the corridor west of the MBTA Fitchburg Line

Proposed Phase 2 Service Alternatives

Alternative 4 – Full Local Service



Service Type

- 5 Trains/day
- All Stops

Stations

- North Adams
- Shelburne Falls
- Greenfield
- Athol
- Gardner
- Fitchburg
- Porter
- North Station

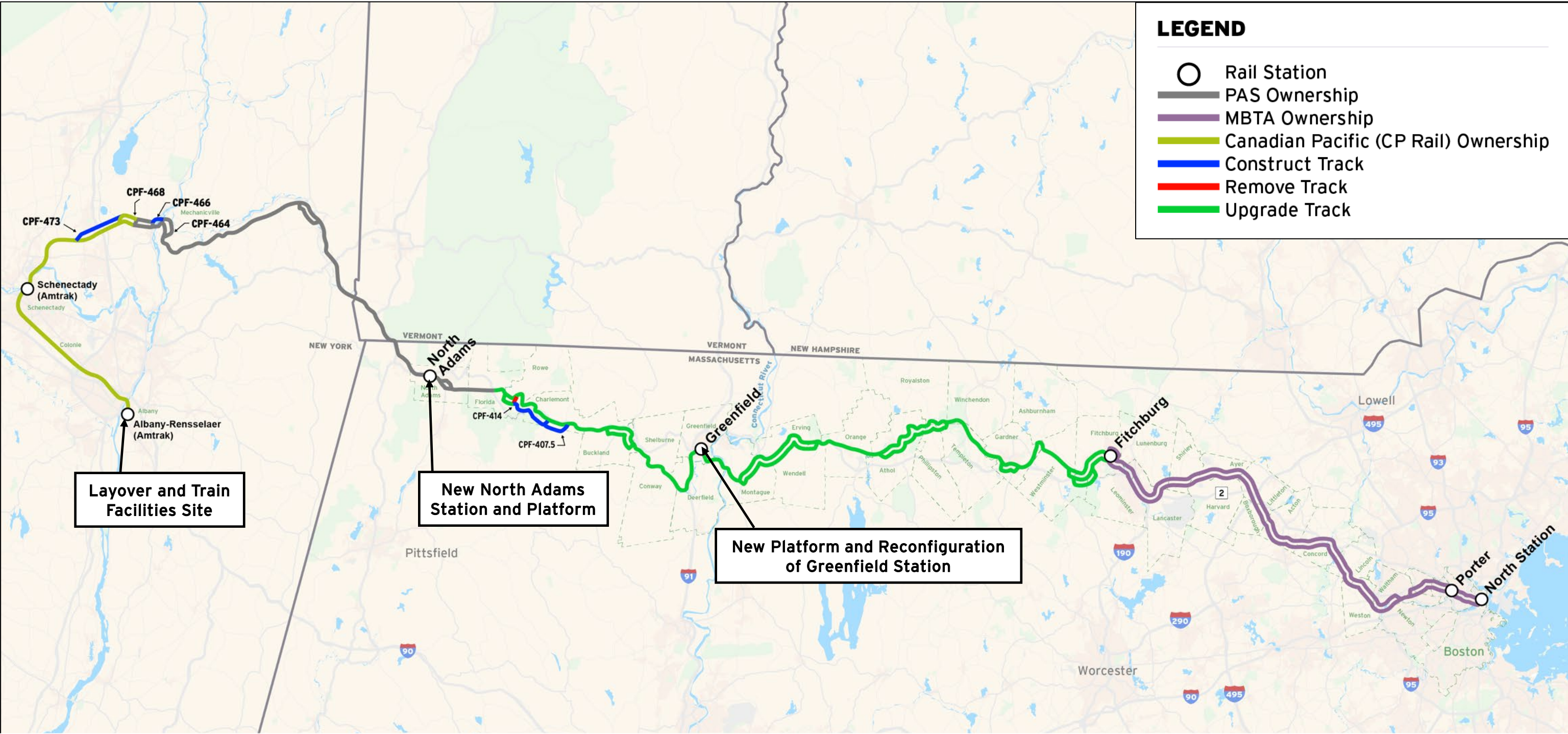
Proposed Improvements

- New double track in Buckland
- Track upgraded to Class 3 and 4
- Crossing renewals
- Bridge rehabilitation
- Signal replacement & Positive Train Control
- North Adams layover

Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
\$862,686,962	\$429,711,003	\$141,368,789	\$0	\$57,782,743	\$15,969,632	\$82,945,944	\$1,590,465,076

Proposed Phase 2 Service Alternatives

Alternative 5 – Albany Extension



Service Type

- 5 Trains/day
- All Stops

Stations

- Albany (NY)
- Schenectady (NY)
- North Adams
- Greenfield
- Fitchburg
- Porter
- North Station

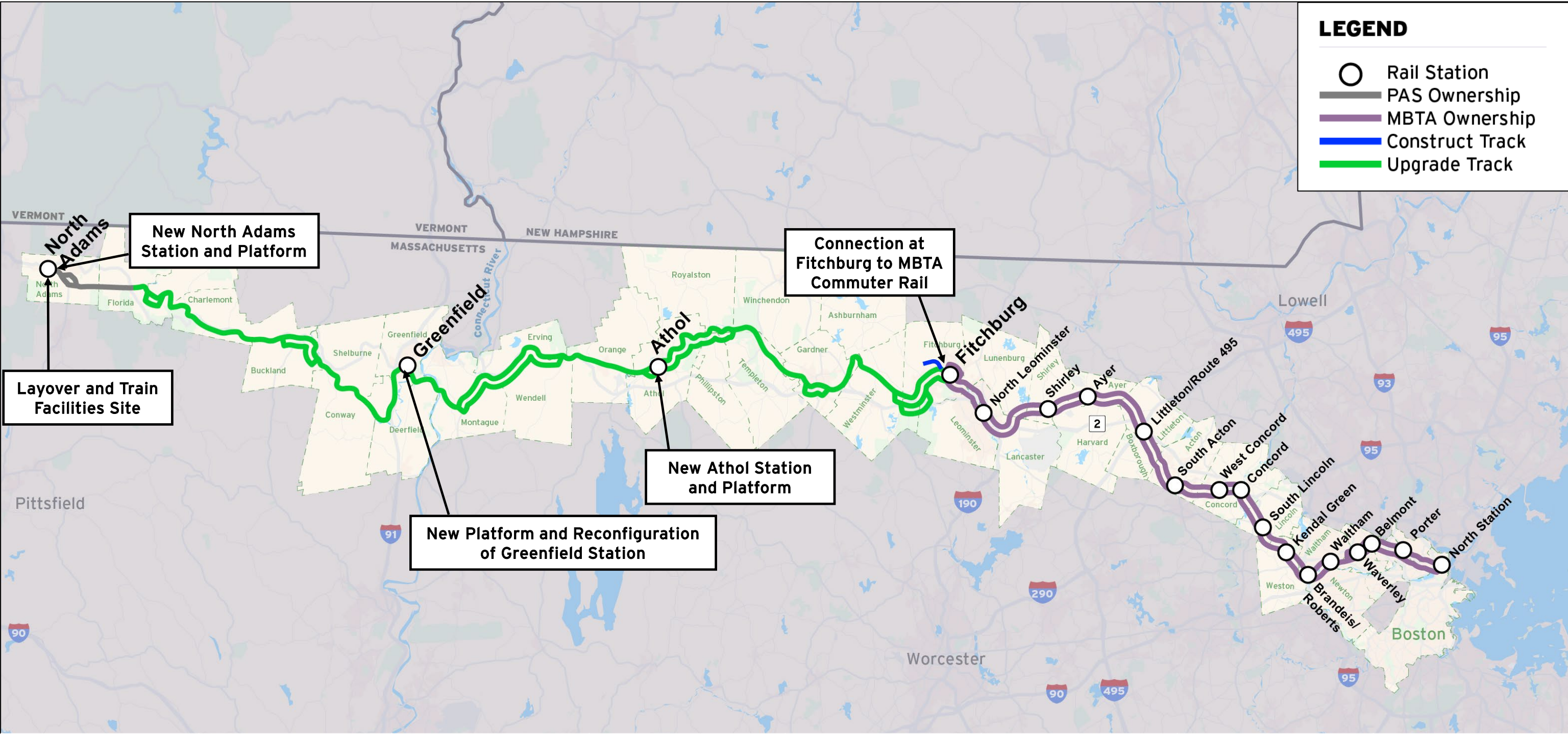
Proposed Improvements

- New double track:
 - Charlemont,
 - Stillwater (NY)
 - Clifton Park (NY)
- Track upgraded to Class 3 and 4
- Crossing renewals
- Bridge rehabilitation
- Signal replacement & Positive Train Control
- Uses Albany layover

Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
\$1,286,096,089	\$429,711,003	\$141,368,789	\$0	\$23,113,097	\$0	\$82,945,944	\$1,963,234,923

Proposed Phase 2 Service Alternatives

Alternative 6 – Northern Tier Rail Link



LEGEND

- Rail Station
- PAS Ownership
- MBTA Ownership
- Construct Track
- Upgrade Track

Service Type

- 5 Trains/day
- Connection to MBTA System at Fitchburg

Stations

- North Adams
- Greenfield
- Athol
- Fitchburg (for connections to MBTA Commuter Rail)

Proposed Improvements

- Track upgraded to Class 3 and 4
- Rehabilitate siding in Fitchburg
- Crossing renewals
- Bridge rehabilitation
- Signal replacement & Positive Train Control
- North Adams layover

Track Work	Bridges	Signals & Grade Xings	Electrification	Stations	Layover	Rolling Stock	Total
\$853,049,390	\$429,711,003	\$141,368,789	\$0	\$34,669,646	\$15,969,632	\$82,945,944	\$1,557,714,406

Proposed Phase 2 Service Alternatives

Total Project Cost Comparisons

Alternative or Project	Total Project Cost per Route Mile	Total Miles per Route
Alternative 1 – Lower Investment	\$ 6,187,280	142
Alternative 2 – Higher Investment	\$ 11,064,097	142
Alternative 3 – Electrified Service	\$ 20,609,150	142
Alternative 4 – Full Local Service	\$ 11,200,458	142
Alternative 5 – Albany Extension	\$ 8,803,744	223
Alternative 6 – Northern Tier Rail Link	\$ 10,969,819	142
Hartford Line	\$18,946,651	62
South Coast Rail	\$ 12,647,189	76

Proposed Phase 2 Service Alternatives Evaluation

Evaluation Criteria	Alt. 1 – Lower Investment	Alt. 2 - Higher Investment	Alt. 3 – Electrified Service	Alt 4. - Full Local Service	Alt. 5 - Albany Extension	Alt 6. – Northern Tier Rail Link
Frequency	5 Trains per day	5 Trains per day	5 Trains per day	5 Trains per day	5 Trains per day	5 Trains per day
Coverage Area and Populations Served	North Adams, Greenfield, Fitchburg, North Station	North Adams, Greenfield, Fitchburg, North Station	North Adams, Greenfield, Athol, Fitchburg, Ayer, Porter, North Station	North Adams, Shelburne Falls, Greenfield, Athol, Gardner, Fitchburg, Porter, North Station	Albany (NY), Schenectady (NY), North Adams, Greenfield, Fitchburg, Porter, North Station	North Adams, Greenfield, Fitchburg, MBTA Commuter Rail Stations (via Transfer at Fitchburg)
Eastbound Travel Times North Adams to Boston	3 hours, 48 mins	2 hours, 48 mins	2 hours, 50 mins	2 hours, 59 mins	2 hours, 49 mins	3 hours, 22 mins
Greenfield to Boston	2 hours, 31 mins	2 hours, 0 mins	2 hours, 4 mins	2 hours, 8 mins	2 hours, 2 mins	2 hours, 34 mins
Maximum Speeds	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)	60 mph (PAS), 80 mph (MBTA)
Environmental Impacts	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal
Passenger Rail Impacts	None	None	None	None	None	None
Freight Rail Impacts	Minimal delay estimated	Minimal delay estimated	Minimal delay estimated	Minimal delay estimated	Delays west of North Adams TBD	Minimal delay estimated
Community/Safety Impacts Grade Crossings Impacted	69 crossings	69 crossings	69 crossings	69 crossings	119 crossings	69 crossings

*The average time travel by car between North Adams and Boston is 2 hours and 48 minutes, between Greenfield and Boston 2 hours and 8 minutes

* Schedules were built with the goal to minimize conflicts with freight rail service and to create no conflict with MBTA service

Proposed Phase 2 Service Alternatives Evaluation

Evaluation Criteria	Alt. 1 - Lower Investment	Alt. 2 - Higher Investment	Alt. 3 - Electrified Service	Alt. 4 - Full Local Service	Alt. 5 - Albany Connector	Alt. 6 - Northern Tier Rail Link
Estimated Annual Ridership	65,880 to 111,460	100,780 to 148,200	196,520 to 304,200	168,040 to 255,460	100,340 to 149,160	3,900 to 23,900
Capital Cost Per Mile	\$6,187,280	\$11,064,097	\$20,609,150	\$11,200,458	\$8,803,744	\$10,969,819
Capital Cost Per Rider	\$7,882 to \$13,336	\$10,601 to \$15,589	\$9,620 to \$14,891	\$6,225 to \$9,464	\$13,161 to \$19,565	\$65,176 to \$399,413
Operating and Maintenance Cost Per Rider	\$ 265 - \$449	\$ 200 - 294	\$97 - \$151	\$116 - \$176	\$311 - \$462	\$1,941 – 4,950
Transportation Cost Savings						
Low Ridership	\$734,353	\$3,756,019	\$6,274,625	\$5,840,958	\$3,784,831	\$140,113
High Ridership	\$1,932,315	\$4,749,951	\$8,151,215	\$7,617,419	\$4,846,631	\$714,576
Annual VMT Reductions						
Low Ridership	3,481,260	7,651,340	11,868,826	11,531,674	7,749,424	283,408
High Ridership	6,040,280	10,539,688	17,322,166	16,694,040	10,834,998	1,952,786
Economic Impacts from Construction						
Output (in millions)	\$1,206 over 3 years	\$2,263 over 4 years	\$4,298 over 4 years	\$2,337 over 4 years	\$2,834 over 4 years	\$2,285 over 4 years
Peak Employment (direct, indirect + induced)	2,679 jobs	3,763 jobs	7,167 jobs	3,980 jobs	4,745 jobs	3,857 jobs

Proposed Phase 2 Service Alternatives Evaluation

Comparison to Other Services

Evaluation Criteria	Northern Tier Passenger Rail (MA-NY)	Pere Marquette (IL-IN-MI)	Piedmont (NC)	Downeaster (ME-NH-MA)	Vermont (VT-MA-CT-NEC)
Service	North Adams - Boston Albany, NY - Boston	Chicago, IL – Grand Rapids, MI	Charlotte, NC – Raleigh, NC	Brunswick, ME – Boston, MA	St. Albans, VT – Washington, DC
Frequency	5 Trains per day	1 Train per day	3 Trains per day	5 Trains per day	1 Train per day
Distance	142 miles (Boston – North Adams) 223 miles (Boston – Albany, NY)	176 miles	173 miles	145 miles	308 miles (St. Albans, VT – New Haven, CT) 605 miles (St. Albans, VT – Washington DC)
Population of Service Area (within 25 miles)	6.7 million	6.5 million	4.9 million	5.1 million	33.8 million
Annual Ridership	3,900 - 23,900 (Alt. 6) 196,520 - 304,200 (Alt. 3)	96,500	211,000	550,000	98,000

Northern Tier operates over a shorter distance than the other services with comparable populations.
Ridership estimates are comparable

Phase Two Key Takeaways

- All alternatives estimated to provide connectivity, mobility, and choice
- All alternatives estimated to provide positive environmental and economic impacts
- Alternative 3 (Electrified Service) and Alternative 4 (Full Local Service) generate higher ridership levels and the measurements associated with them, including transportation cost savings and VMT reduction



Public Comment

Public Comment & Discussion

- **General comments or questions about the alternatives evaluation?**
- **What next steps would you recommend?**
 - Which of these alternatives best address the goals and objectives of the study?
 - Are there additional items that could be further examined?

Questions and Answers



- “Raise your hand” to be unmuted for verbal questions



- Submit your questions and comments using the Q&A button



- Please state your name before your question



- Please share only 1 question or comment at a time, limited to 2 minutes, to allow others to participate



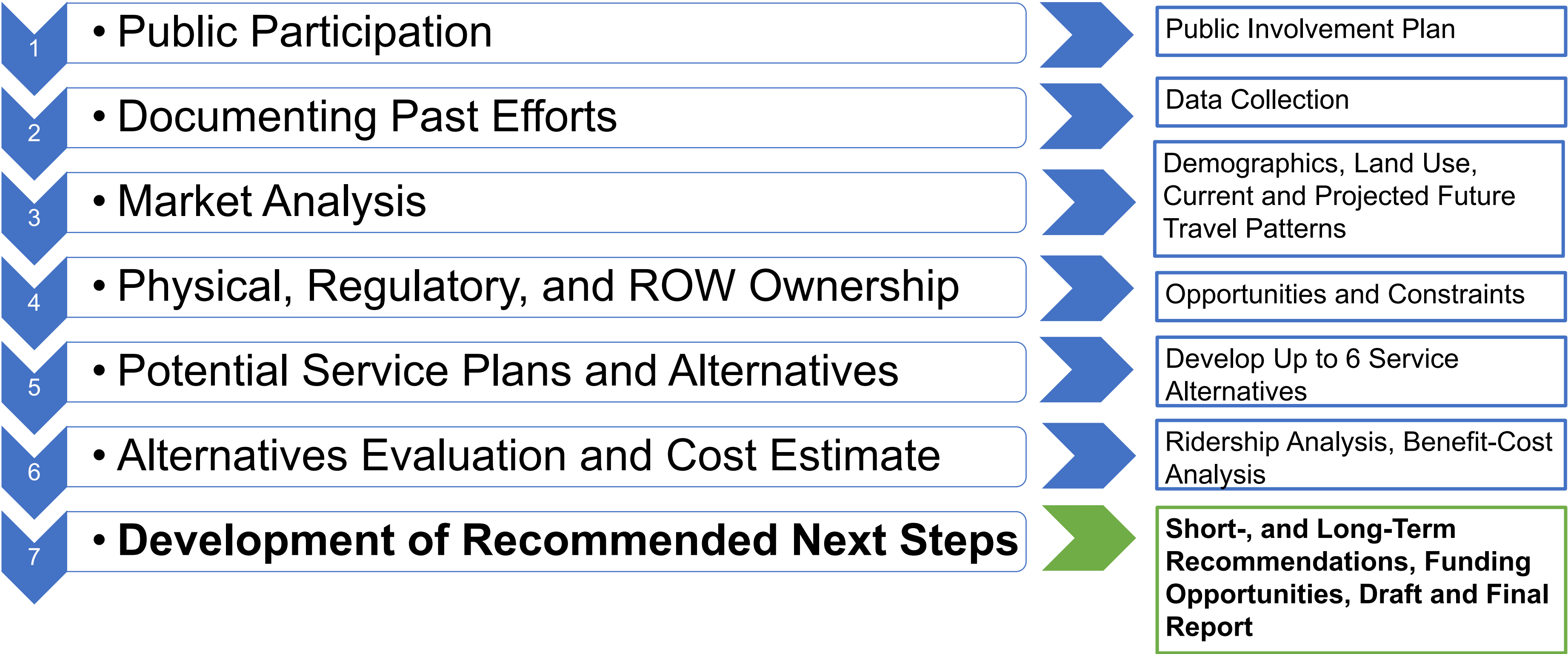
- To ask a question via phone, dial *9 and the moderator will call out the last 4-digits of your phone number and unmute your audio when it is your turn.

**All questions and comments are subject to disclosure for public records.
Please use these functions for project related business only.**



Next Steps

Next Steps





Learn More

Please visit the Study website to receive Study updates and to view past materials and meeting recordings:

<https://www.mass.gov/northern-tier-passenger-rail-study>



Please visit the PIMA website to submit your comments and questions:

<https://tinyurl.com/NTPRS-COMMENTS>

