

# Modernizing the Framingham / Worcester Line

## Rapid, Reliable Transit for Framingham, Worcester, and Newton

### Executive Summary/Introduction

In this report, TransitMatters argues for a rapid and aggressive implementation of a Regional Rail operating model along the Framingham/Worcester Line. The 2019 commitment by the former MBTA board recognized the need for a new model of service delivery and requisite capital investments to accomplish it that meets needs beyond the rush hour focus of commuter rail. The untapped ridership potential along the corridor and substantial growth - with the City of Worcester growing over 37% between 1990 and 2021 and immense demand increases on the underserved portion of the line serving Boston and Newton - combined with the need for intercity rail service to Western Massachusetts, indicate that the line ought to be the next priority for modernization following Phase 1 of Regional Rail electrification.

With Regional Rail, the trip time from Boston to Worcester will fall to 43-50 minutes depending on the stopping pattern, compared to a travel time of 1:38 (or 1:25 for express service) now, and the Boston-Framingham trip will fall to 35 minutes (24 express).

Trains can run every 7-10 minutes or better between Boston and Framingham and every 15-30 minutes between Boston and Worcester. Regional Rail improvements would set the stage for a more successful East-West Rail: full electrification to Springfield enables a 90-minute or better trip time and hourly or better frequency between Boston and Springfield. Cheaper fares, additional stations, and improvements to connecting transit and walking/biking infrastructure will further boost ridership potential.



TransitMatters is a 501(c)(3) nonprofit dedicated to improving transit in and around Boston by offering new perspectives, uniting transit advocates, and informing the public. We utilize a high level of critical analysis to advocate for plans and policies that promote convenient, effective, and equitable transportation for everyone.

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This entire program can be completed affordably and efficiently, given adequate governance and oversight. Success requires active oversight by the Commonwealth, a commitment by the Massachusetts Legislature to provide design and construction funding to allow the MBTA to staff up, and a dedication by the MBTA to best practices in modernization and an “organization before electronics before concrete” mindset that makes only the most necessary expenditures. Launching design as soon as possible is crucial to achieving these measures.

In the shorter term, fast-tracking high platforms and a bypass track between Newton and Framingham will allow for more frequent service to provide mitigation for the I-90 (Mass Pike) upgrade through Allston and the 495/Mass Pike interchange reconstruction project.

In the longer term, a modern Framingham/Worcester Line will help the Commonwealth meet its 2050 net zero emissions goal, provide equitable access throughout and to Boston, MetroWest, Greater Worcester, and Western Massachusetts, and play a role in facilitating the continued prosperity and competitiveness of the Commonwealth.

## Acknowledgments

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## Current Situation

The line serves three travel markets: an intercity, long-range market serving the cities of Worcester and Framingham and intermediate suburbs, a suburban market between Framingham and Newton which has long been oriented around trips to and from Boston, and an urban market from Newton on the east. Regional Rail measures such as electrification, full accessibility, affordable, streamlined fares, and new stations - enabling trains to run at minimum every 15-30 minutes all day - and improved first-last mile connectivity would meet 21st-century travel needs, benefiting all potential travel markets.

## Ridership

The Framingham/Worcester Line is the third-busiest MBTA commuter rail line, with just over 10,600 daily riders in October 2022, falling from second in 2018 when it had 18,637 daily inbound riders. Before the COVID-19 pandemic, the line was the fastest-growing in the MBTA commuter rail system. In 2018, Worcester, Framingham, and Lansdowne (previously named Yawkey) had over 1,000 daily riders; all stations from Grafton to Wellesley Square, as well as Boston Landing (opened in 2017), had over 500 daily riders, while the remaining stations all had over 200 daily riders.

As of summer 2023, according to Keolis conductor counts, MBTA commuter rail ridership remains around 60-70% below pre-pandemic levels systemwide, and the long-term impacts of flexible work scheduling remain unclear. However, traffic in Metro Boston, including along the Mass Pike, which parallels the line, has surged past pre-pandemic levels. The pandemic has led to a sharp, likely long-term drop in the 9-5 commuting demographic. Adapting to meet post-COVID travel trends is necessary for the long-term health of the system.

## Travel Demand

The line’s outer terminus at Worcester serves the second largest city in both Massachusetts and New England, with over 211,000 residents and over 13,000 jobs within walking distance of Union Station. Worcester also grew substantially, according to the 2020 Census, and recent development will add more residents, employees, and occasional travelers (the topic of population and housing growth is addressed further in the Goals and Growth Potential section). Worcester was the fastest-growing city in the Northeast as of 2021, and Union Station had 1,298 daily commuter rail boardings as of 2018. The city’s downtown has seen notable growth, including the new large-scale mixed-use development at Polar Park.

Framingham is a strong commuter origin for Boston, with about 12,000 (~38%) of commuters in the city of Framingham working to the East, over 9,000 of which travel over 10 miles to their job.

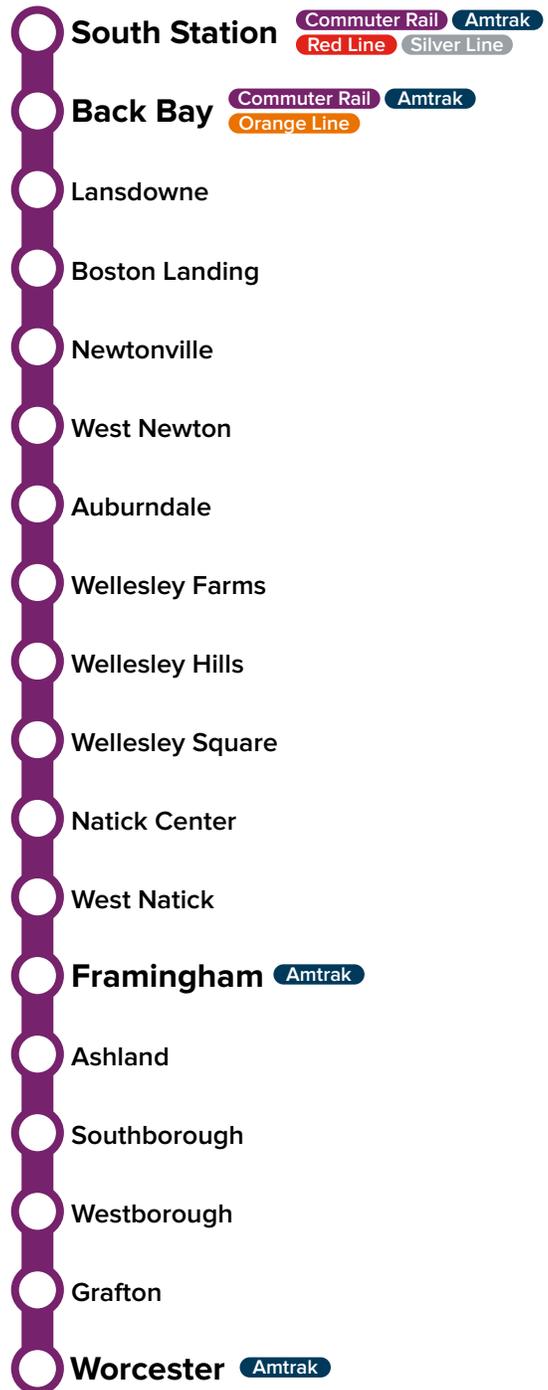
In addition to the high job counts at Worcester, intermediate stations east of Framingham also have several jobs within theoretical walking distance; except for Wellesley Farms, all of these stations have over 1,000 jobs within half a mile. Analysis of Census data shows that many of these employees commute from another community along the corridor. Additionally, several colleges and universities along the line provide strong all-day demand potential.

## Line Characteristics

The Framingham/Worcester Line spans about 44 miles from South Station to Union Station. The all-stops trip takes over 90 minutes; the trip from Framingham to South Station takes between 44 minutes on express trains and 52 minutes on local trains. During rush hour, peak direction trains run express to and from Worcester, with local trains terminating at Framingham.

## Worcester Line

Current

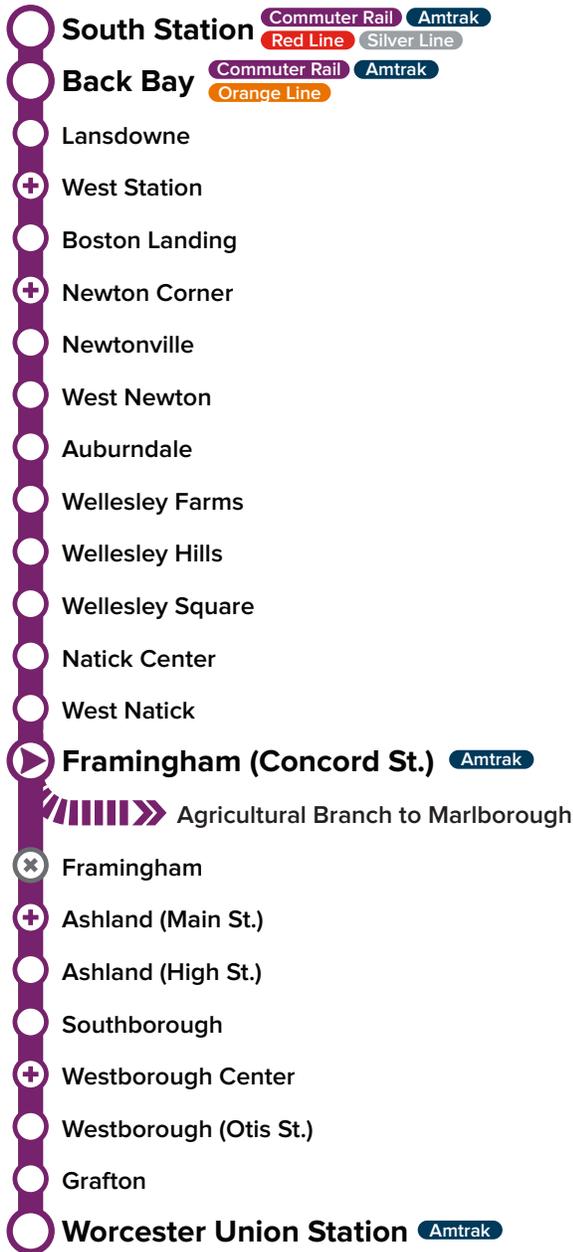


### Legend

- Existing Line
- Existing Station
- RL Transit Connection

# Worcester Line

Proposed



## Legend

- Existing Line
- Proposed Branch Line
- Existing Station
- Proposed New Station
- Proposed Station Relocation
- Proposed Station Closure
- Transit Connection

## Jobs

Excluding South Station and Back Bay, there are 81,094 jobs within half a mile by air of current and proposed stations: 27,825 between Framingham and Worcester, 7,977 between West Natick and Wellesley Farms, and 45,292 between Auburndale and Lansdowne. Here are the counts of jobs within half a mile by air of each train station on the line, all as of 2020. Italics indicate proposed infill stations.

Station	Jobs
Lansdowne	11,645
<i>West Station</i>	~ 13,594**
Boston Landing	9,520
<i>Newton Corner</i>	3,904
Newtonville	2,702*
West Newton	1,582
Auburndale	1,985*
Wellesley Farms	108
Wellesley Hills	1,574
Wellesley Square	3,166
Natick Center	2,123
West Natick	1,006
Framingham	2,021
<i>Framingham (Relocated to East of Concord St)</i>	2,928
<i>Ashland Main St</i>	1,379
Ashland High St	466
Southborough Cordaville	180
<i>Westborough Center</i>	2,174
Westborough Otis Street	415
Grafton	911
Millbury Junction	675
Worcester Shrewsbury St	4,169
Worcester Union Station	13,648

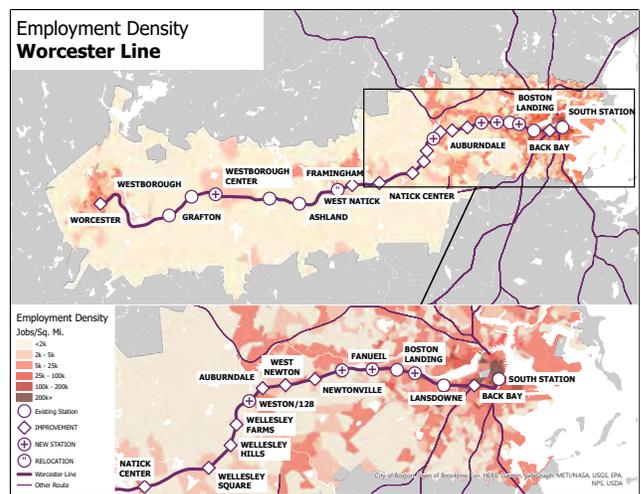
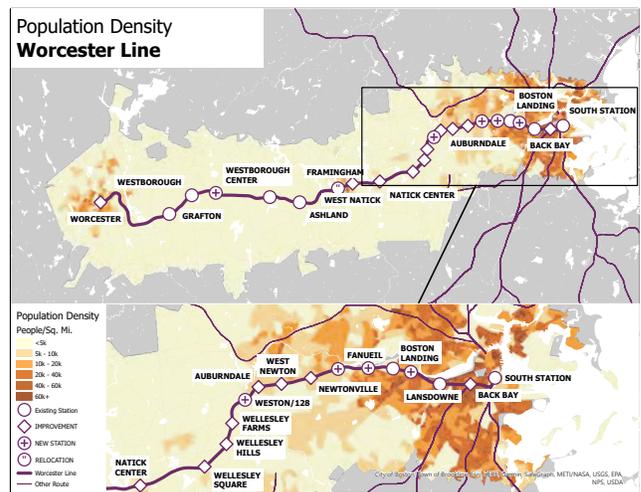
\*These stations are located near businesses and institutions that are headquartered near the station but employ workers in other locations. These numbers are adjusted to compensate and avoid an inflated count but may be lower than reality.

\*\*Parts of Boston University fall within a walkable distance from the proposed West Station site, but OnTheMap does not specify which jobs at BU occur at which parts of the campus. To calculate a job count, we took the total jobs at BU (18,701), divided it by two, and added 4,604, which is the number of non-BU jobs within a 0.5-mile radius. In addition, West Station is planned to have large-scale redevelopment adjacent in Beacon Yard, meaning that final job counts are likely to far exceed what currently exists.

### Population Density and Growth

According to data from Decennial Censuses and five-year American Community Surveys, both the Boston Metropolitan Area and the Worcester Metropolitan Area showcased a growing and increasingly diverse population. While the Boston Metro area’s population increased by 18.8%, the Worcester Metro area’s population increased by 37.2%.

Furthermore, both metro areas have seen increased racial diversity. The transforming racial composition of both metropolitan areas served by the Framingham/Worcester line is also critical in understanding who the commuter rail serves or can serve. From 1990 to 2020, the Boston Metro’s percentage of people of color/mixed out of the total population increased from 11.1% to 31.7% (20.6 percentage points). Similarly, the Worcester Metro’s percentage of people of color/mixed out of the total population increased from 6.2% to 26.5% (20.3 percentage points). The increasing total population and racial diversity of the observed cities demonstrate the potential for train accessibility to reach a larger and more diverse population.<sup>1</sup>



### Intermodal Connections

All but three of the stations along the Framingham/Worcester Line have connectivity to alternative forms of transportation, such as bus or rail networks, either at the station or within a few feet of the station. Despite this, there are still crucial areas for improvement. Many stations lack separated bike lanes and accessible bike storage and remain inaccessible to bikers. Stations also suffer from insufficient sidewalks and pedestrian signaling.

High-frequency bus service in suburban communities, combined with high-frequency Regional Rail, can drive mode shift by expanding the catchment area for inbound, suburb-to-suburb, and reverse commuters.

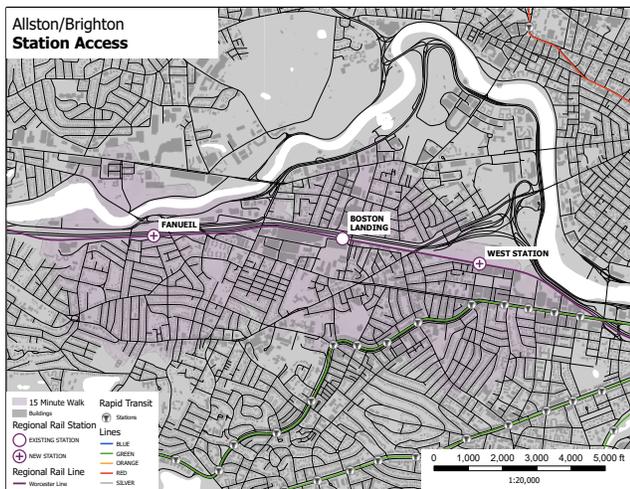
<sup>1</sup> Used census-defined Metropolitan Statistical Area, decennial census data was used from [IPUMS NHGIS](#) (1990, 2000, 2010, 2020) and ACS Five-year Estimates were used from [US Census Bureau](#) (2011-2019, 2021)

Suburbs of Toronto such as Scarborough, North York, and Etobicoke are similarly auto-oriented when compared to those served by the Framingham/Worcester Line; however, buses run frequently, and the mode share of transit in these communities is notably high: 35.5%.<sup>2</sup>

### Boston Landing

The Boston Landing station was opened in 2017 to serve the newly constructed New Balance headquarters, an athletic training facility, and the surrounding mixed-use development. The new development was an effort at revitalizing an industrial area within Brighton, which made establishing new connectivity options crucial.

New Balance funded the construction of the Boston Landing station to increase the ability for commuters and patrons to access the newly built area. In 2022, Bose consolidated its headquarters in Framingham, leaving the space it had previously had in Boston Landing. With the addition of Regional Rail and the ease of access that comes with it, a new company could be encouraged to move into Bose's old space. This additional ease of access could also incentivize further development within this new area, bringing economic benefits to Brighton.



### Framingham-Worcester

Framingham is a highly populated, relatively dense city with significant inflows and outflows to Boston and other MetroWest municipalities like Natick and Wellesley. The hub for MetroWest Regional Transportation Authority buses is nearby; moving the hub to Framingham station and timing bus and train arrivals would further improve mobility and increase mode shift potential.

The stations between Framingham and Worcester were rebuilt in the 1990s when commuter rail service west of Framingham restarted. They are designed to prioritize park-and-ride trips, with substantial parking at each stop. Before the pandemic, Westborough station's parking lot would regularly fill up before the end of rush hour. While demand patterns post-pandemic have changed, anecdotal reports suggest that rush-hour trains are again busy in this segment. Although the Worcester line passes through downtown Ashland and Westborough, the town's stations were rebuilt away from their historic town center sites on parcels with substantial parking and minimal nearby development.



<sup>2</sup> Statistics from Toronto Board of Trade, NEXT STOP Building Universal Transit Access

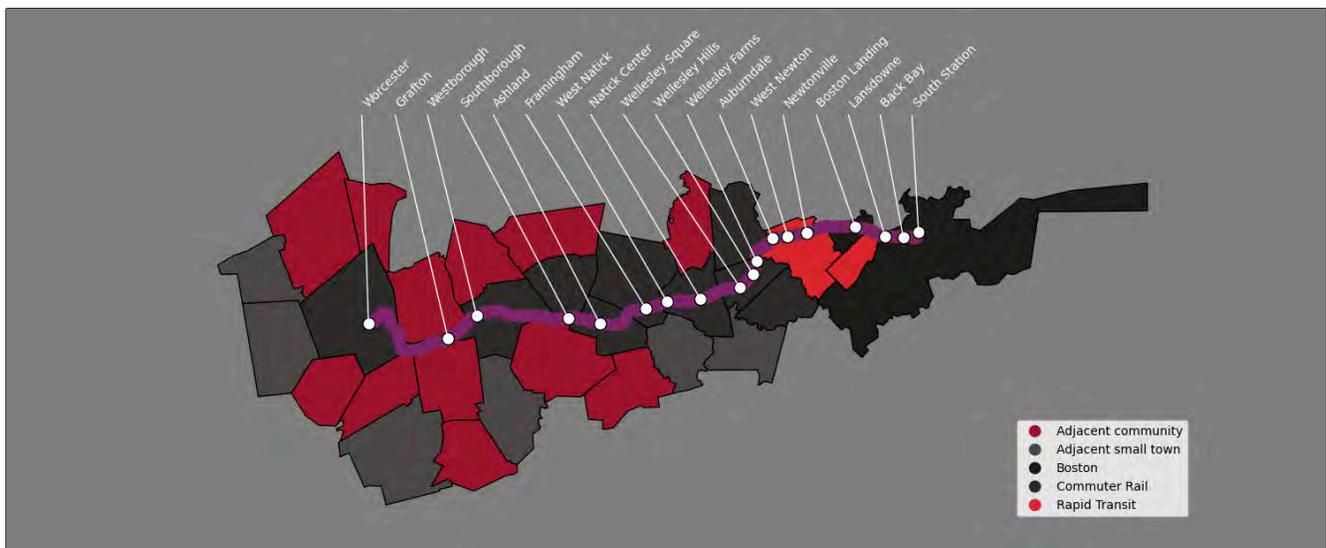
## Goals and Growth Potential

### MBTA Communities Law

In 2022, the Commonwealth enacted the MBTA Communities Act. This law requires municipalities served by the MBTA or close to an MBTA line to have at least one zoning district permitting dense, multi-family housing. The Framingham/Worcester Line directly serves nine communities outside of Boston, and 18 other municipalities nearby fall within the adjacency threshold.

For each of the 27 communities in question, the state government has published estimates of the minimum multi-family unit capacity that will need to be zoned for by deadlines set out in the law (between the end of 2023 and the end of 2025). These estimates, below, show a total of **32,971 potential new housing units** along the line soon. Without a significant and unprecedented shock to labor demand in the greater Boston area, developers will likely take advantage of this opportunity rapidly.

The Framingham/Worcester line includes stops serving 9 MBTA communities: Newton, Wellesley, Natick, Framingham, Ashland, Southborough, Westborough, Grafton, and Worcester. The line also serves 18 adjacent communities and small towns (ST), included in the table below.



Community	Community Category	2020 Housing Units	Minumum Multi-Family Unit Capacity	Minimum Land Area	Developable Station Area	% Of District To Be Located In Station Area
Ashland	Commuter Rail	7,495	1,124	50	272	40%
Framingham	Commuter Rail	29,033	4,355	50	270	40%
Grafton	Adjacent Community	7,760	776	50	82	0%
Hopkinton	Adjacent Community	6,645	750	50	79	0%
Natick	Commuter Rail	15,680	2,352	50	680	75%
Newton	Rapid Transit	33,320	8,330	50	2,833	90%
Southborough	Commuter Rail	3,763	750	50	167	20%
Wellesley	Commuter Rail	9,282	1,392	50	921	90%
Westborough	Commuter Rail	8,334	1,250	50	194	20%
Worcester	Commuter Rail	84,281	12,642	50	290	40%

## Universities

The Worcester Line notably passes numerous higher learning institutions whose students, faculty, and staff would benefit from frequent, reliable, and affordable connectivity to Boston, Worcester, and between each other. Worcester Polytechnic Institute, Worcester State University, Holy Cross, Clark University, and UMass Chan Medical School are all located within the City of Worcester. In the middle of the corridor, Framingham State University is close to Framingham station; Wellesley is home to Wellesley, Babson, and Olin colleges; MassBay Community College, a commuter-primary school, has campuses in Framingham, Wellesley, and Newton.

On the urban end, West Station would serve portions of the Boston University and Harvard University campuses; parts of BU's campus are already accessible from Lansdowne.

However, the commuter rail model, with infrequent service and high fares, is not useful for these communities. For instance, many Babson, Olin, and Wellesley students, with a combined student population of over 6,350, turn to ride-sharing services or car ownership.

Students would benefit from a Regional Rail network serving these stations as it would provide a cheaper alternative to car ownership. Besides students, faculty and staff at these schools would also benefit from Regional Rail. At Wellesley College, for example, 82% of faculty and staff must commute via a personal vehicle with only a driver inside. 11% of the college’s employees commute via non-motorized means such as biking or walking. Only 7% carpool or take campus/public transportation<sup>3</sup>. At Babson College, 92% of faculty and staff must commute via a personal vehicle with only a driver inside. Only 3% of the college’s employees commute via non-motorized means such as biking or walking, and only 5% carpool or take campus/public transportation<sup>4</sup>.

## 1-90 Project and Near-Term Improvements

### Current Situation

The long overdue Allston Viaduct project will reduce the footprint of the Mass Pike through Allston, improve walkability, livability, and the urban environment in Allston, and replace infrastructure that is nearing the end of its useful life. But the project will prove highly disruptive, exacerbating Metro Boston's traffic congestion, which exceeds pre-COVID levels.

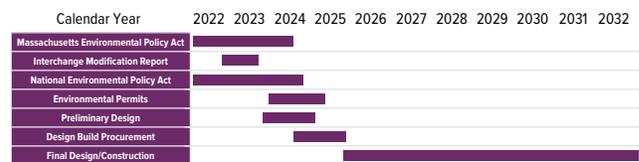
Given the magnitude of this project and the importance of improving transit along the corridor to drive mode shift, the mitigation plan for the Mass Pike projects must include enhanced service on the Framingham/Worcester Line and capital investment in Regional Rail improvements to bring some on line during the project.

Trains run hourly to Worcester off-peak, thanks to efforts to reorient schedules during the COVID-19 public health emergency.

While this is an improvement over the pre-COVID rush hour-oriented schedule (which only provided four midday roundtrips between Boston and Worcester), trip times from South Station to Worcester exceed 90 minutes.

### Potential Timelines

In their 2022 grant application, MassDOT and the City of Boston assumed construction activities on the Allston I-90 project would begin in late 2025<sup>5</sup>. This is a good lower bound for potential construction start, though the lack of federal money at the time of publication means that this timeline will likely be delayed.



### Disruptions and Rail Mitigation

It is vital that disruptions to the Worcester Line itself be minimized during the construction process. The Worcester Line has an important role to play in mitigation, but the success of any mitigation strategy is based on a commitment to maintain (and wherever possible, increase) service quality.

Key projects within the project timeframe include the Worcester Triple Track project, West Station infill, and construction of high level platforms at the Newton stations<sup>6</sup>.

<sup>3</sup> [Wellesley College OP-17: Employee Commute Modal Split](#)

<sup>4</sup> [Babson College | Scorecard | Institutions | STARS Reports](#)

<sup>5</sup> [Allston Multimodal Project - 2022 USDOT Mega Grant Application](#)

<sup>6</sup> We are indebted to our partners at A Better City for their February 2023 report [Menu of Mitigation Measures - addressing transportation impacts: i-90 Allston multimodal project](#), from which this table is adapted

Project	Status	Benefits	Projected Completion	Sequence Issues
Newton Stations accessibility upgrades	Design	Travel Time, Accessibility	2024-2027	Likely conflict, manageable
Natick Center Station	Construction	Travel Time, Accessibility	2024	
Framingham/Worcester triple-tracking	Design	Frequency, Reliability	2030 (uncertain)	
West Station	Planning	New station, easier access for growing areas	Unknown; timelines vary	

Although electrification is a vital long-term investment and has significant service-quality benefits, we do not believe that considerable progress on electrification is possible before the likely start of construction.

There are also a number of short-term interventions that may substantially boost ridership and mode shift for the duration of the project. A February 2023 report by A Better City contains more details on many of these recommendations, including increased parking options at commuter rail parking lots, express bus service, and managed lane programs, including HOV lanes or demand-based pricing. TransitMatters supports these interventions and believes that the most impactful mitigation will be one that both improves the quality of service and includes other measures to incentivize commuter rail over driving.

Other states across the nation have successfully used improved rail service to mitigate congestion due to highway construction projects, many of which have been successful and made permanent.<sup>7</sup> These investments will not only provide immediate mitigation but will also lay the groundwork for full regional rail service on the Worcester Line.

Unfortunately, there are complicating factors that make increasing frequency challenging. The first is fleet and crew availability. It may be necessary to lease (but not purchase) equipment in order to increase frequency, though the fleet should be optimized to the fullest extent possible. Implementing this short-term goal would require resolution of equipment and staffing constraints. Negotiations with Keolis and rail unions ought to commence promptly, with the objective of resolving all barriers to implementing this program before the highway project begins. Improved crew utilization ought to be applied throughout the system, improving throughput and the work experience.

The second is the lack of platforms on the outbound side at stations in Newton, which severely constrains service delivery.

If half-hourly trains were implemented during the mitigation period, they may need to skip the Newton stations in the reverse peak direction until the Newton stations have platforms on both tracks, as discussed further below.

<sup>7</sup> For example, Florida's Tri-Rail service began with Federal Highway Administration funding to mitigate I-95-widening-related disruptions; likewise, Connecticut's Shore Line East service began as mitigation for work on I-95.

Fortunately, a variety of projects currently underway will enable higher frequency, particularly the Natick Center and Worcester Union Station platform projects and upgraded signals and interlocking work.

- » Upgrades to the Tower 1 interlocking
- » Completion of the new island platform at Worcester Union Station, along with the associated interlocking improvements near Worcester Station (both currently in design).

These treatments will greatly improve service relative to the status quo and lay the groundwork for the broader transformation of the line's operation along a Regional Rail operating model.

## Capital Investment

Core capital investments are the electrification of the Framingham/Worcester Line with overhead catenary systems (OCS), the purchase of high-performance electrical multiple units (EMUs), and the installation of high-level platforms at all stations. All of these improvements are necessary for the transition to a regional rail service model and, together, allow significantly faster, more reliable, more efficient, and more accessible service.

On the Framingham/Worcester Line we recommend several other improvements to further fast and frequent service, including triple-tracking a portion of the line to allow more trains to run, changes to track structure to allow higher top speeds, and grade separation to remove roadway-railway conflicts.

## Electrification

Electrification with an overhead catenary system (OCS) and electric multiple unit (EMU) trains is the gold standard for Regional Rail service, and crucial to achieving these outcomes on the Framingham/Worcester Line.

EMUs are 5-20 times more reliable than diesel trains. They are also faster: they're capable of higher top speeds and accelerate very quickly. Together with high platforms, they reduce the time cost of serving a station from about 3 minutes to 60-75 seconds. As the Worcester Line's existing stop spacing in Newton and Wellesley is very dense, and the line has the potential for multiple infill stations, electrification is especially important to cut travel times and make rail competitive with driving. Electrification eliminates point-source pollution from trains; moreover, the speed and reliability benefits facilitate mode shift away from cars, helping to reduce overall pollution.

Based on Amtrak's Northeast Corridor electrification project in the late 1990s (\$6.6 million per mile in 2023 dollars), electrifying the 44-mile-long Framingham/Worcester line should cost \$290 million, including catenary and supporting infrastructure. This figure is high by international standards and is used as a realistic upper bound; it is possible to achieve a lower cost with disciplined project management and attention to best practices from countries with a wide range of electrification experience, including New Zealand, Israel, Germany, Austria, Italy, Finland, Denmark, and Norway. At comparable costs, the Framingham/Worcester Line could cost as little as \$200 million to electrify.<sup>8</sup>

Additionally, because EMUs are the standard for international regional railroads, the market for EMUs is developed and competitive, making them especially easy to buy and maintain. Changes made in 2018 to Federal Railroad Administration regulations made the EMUs used in Asian and European countries largely accessible to the US market.

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<sup>8</sup> For further analysis, see the TransitMatters report [Regional Rail Electrification: Costs, Challenges, and Benefits](#) (Fall 2021) as well as research by the Transit Costs Project.

## Bridge Clearance and Discontinuous Electrification

A 2022 report prepared for the MBTA's Rail Transformation office by Network Rail Consulting emphasized the potential cost savings of discontinuous electrification for commuter rail electrification.<sup>9</sup> In particular, the Network Rail report stressed the cost savings found by overcoming the need to rebuild low structures such as bridges. The proposal for the Framingham/Worcester line uses a discontinuous electrification plan that links two unwired portions together by a middle section with overhead catenary. The easternmost unwired section is from Boston's South Station to a point between the Auburndale and Wellesley Farms stations. The westernmost unwired section is from the Worcester station to between the Westborough and Southborough stations. This would require using battery electric multiple units (BEMUs), charging on wire where it exists and running on battery power elsewhere.

Although the Network Rail report recommends extensive battery operation, it does not identify a commensurate number of structural or clearance conflicts. The Network Rail report identified no structural impediments to overhead catenary on the Worcester-Westborough segment despite recommending battery operation on that portion of the line. On the wired middle section, Network Rail identified four conflicting structures. However, one of these, Boden Lane Bridge in Natick, is currently being demolished and a replacement is being designed.

This replacement process presents a low-cost opportunity to future-proof for electrification. The other three structures—three separate bridges near Natick Center station—are identified for a discontinuous electrification treatment.

On the easternmost unwired segment, the Network Rail report does not identify any structural conflicts until the Allston area.

Even a very conservative approach to electrification would see the majority of the line—from Allston to Worcester Union Station—electrified with overhead catenary. Given that the remaining potential low clearances on the approach to South Station are likely highly suitable for more precise discontinuous electrification measures,<sup>10</sup> that do not require significant time off-wire, and that many would be reconstructed as part of the Allston I-90 project, we do not believe that there are significant physical barriers to fully electrifying the line. Simply “coasting” through minor non-electrified sections may be feasible in many cases. In cases where coasting is not practical, other interventions include surge arrestors (to allow continuous under-wire operation under a low-clearance bridge) and targeted bridge raising or undercutting.

TransitMatters does not believe the challenges and tradeoffs of deploying BEMUs on the Framingham/Worcester Line are outweighed by theoretical cost savings afforded by fewer miles of overhead catenary. BEMUs cost more per train than conventional EMUs, meaning procurement costs are higher at higher frequency; trains are a recurring investment, whereas investments such as bridge raising are one-time investments that pay long-term dividends. For this reason, the use of BEMUs is currently restricted to short lines with low ridership and low frequency, not high-ridership intercity routes, or as a supplement to an extensively wired system.

<sup>9</sup> Grecia White, “[T considers Battery-Equipped Trains to Accelerate Rail Electrification Plans](#),” *StreetsblogMass*, July 12, 2022.

<sup>10</sup> For instance, trains can briefly “coast” on unwired segments; other options include surge arresting devices under low-clearance bridges.

<sup>11</sup> [An analysis by German researchers](#) found that 30 minutes is the maximum frequency at which BEMU deployment has a favorable cost-benefit ratio over conventional trains, and only on lines that are not mostly electrified.

<sup>12</sup> A typical example, JR East's Oga Line, is a 16.4 mile single-tracked rural line.

Moreover, success at expanding battery-electric trains has been mixed. Indeed, the Framingham/Worcester line is likely the worst line on the system to trial battery-electric trains: it is long, sees frequent service, has no branches, and hosts other rail service that would stand to benefit from OCS installation.

### High-Level Platforms

High-level platforms at all stations are crucial for guaranteeing accessibility and implementing Regional Rail speeds and frequency on the Framingham/Worcester Line. Today, only South Station, Lansdowne, and Boston Landing have full high platforms. All stations from Newtonville to West Natick have completely inaccessible platforms, while others have “mini-highs” with accessible level boarding to only one car of the train. Further, the Newton stations currently have platforms on just one side, limiting frequency and harming reliability. This situation falls short of ADA standards and creates discomforts and safety hazards for riders with mobility constraints. It also lengthens dwell times, especially at busy stations like Back Bay. High-level platforms provide full accessibility to all users, making boarding safer and more comfortable. High platforms reduce dwell time by about a minute per station stop at peak travel times.



Image credit: James Wang



Image credit: James Wang

Fortunately, a number of high platform projects are either underway or in design. High platforms at Natick Center and Worcester Union Station are under construction; the latter is slated to open in winter 2023.<sup>14</sup> Bidirectional platforms for the three Newton stations are in design, and high platforms at West Natick and all three Wellesley stations are in design as part of the Worcester Triple Track project. But these projects lack construction funding; it’s crucial that the Legislature allocate funding promptly.

The mitigation plan for the I-90 closure should include an aggressive rollout of high-level platforms at the remaining stations along the line. Design for the remaining platforms ought to commence promptly, with the objective of bringing as many as possible on line during the I-90 project. If stations cannot be completed before the project begins, temporary platforms, such as those being used at Union Station, can serve as an economical stopgap. It’s crucial to expedite their delivery of temporary platforms; a temporary platform at Lynn on the Newburyport/Rockport Line to enable reconstruction of Lynn station took several months to install, but this is because it needs to be built at an alternate site. In contrast, temporary platforms can be installed at the existing stations along the Framingham/Worcester Line.

13 Plans for significant deployment of BEMUs in the Netherlands were shelved in November 2022 due to higher-than-expected costs, despite an earlier analysis suggesting that BEMUs would serve as a cost-saving measure.

14 Most recent project status from the T as of November 2023

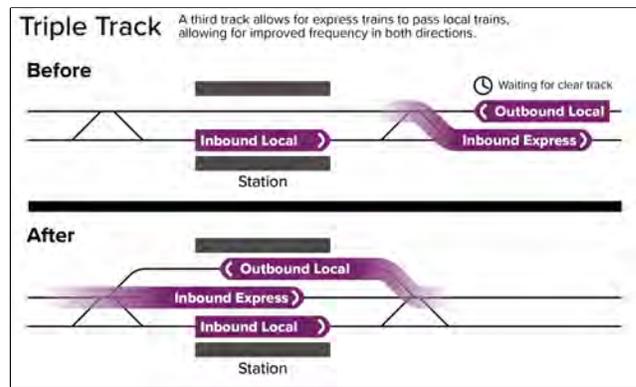
This is particularly important at Framingham, where Regional Rail frequencies necessitate grade separating the intersections downtown and new station construction; a temporary platform ought to be used here until the new station is built.

High platform costs have varied in recent years, and depend on factors including available right-of-way and the amount of vertical circulation infrastructure needed, particularly elevators. The four Fairmount Line stations built in the 2010s cost about \$21 million each in 2020 dollars; more complex projects have cost in the range of \$30 million. Back Bay and the Newton stations will require somewhat of a premium to account for unique vertical circulation needs due to constrained space, and the Triple Track project includes partial right of way widening, but it's important to monitor construction so that cost overruns are avoided. Stations on the outer end of the line are generally unencumbered, so we are comfortable using the \$21 million figure for all stations west of Framingham.

### Triple Track

To improve express service, the MBTA is currently in the process of planning for an express-only third track, extending from Control Point (CP) 21, just east of Framingham Station, to CP 11, just west of Route 128. The project also includes signaling improvements and, as mentioned above, construction of high platforms at affected stations.

Triple-tracking will require realigning the tracks and reconstruction of all the stations, but the existing ROW is sufficiently wide to avoid land takings or displacement of buildings, and no major bridge reconstruction will be required. The tracks would be arranged such that the center track is an express track bypassing platforms at the five affected stations; the under-construction Natick Center platforms are being built to accommodate this express track.



The Framingham/Worcester Line passes through a number of dense, job-rich neighborhoods in Boston and Newton. Accordingly, there are a number of opportunities for “infill” stations, that is, stations built on the existing right of way. While today it would not be feasible to build many because of slow diesel acceleration and low frequency, with electrification, EMUs, and trains at least every 15 minutes, multiple new stops can be made while still drastically reducing trip times for all riders.

Some of these infill stations, such as West Station, are highest-priority investments and should be built as soon as possible. Others, such as Brighton Parsons Street, will offer additional transportation options but do not necessarily need to be built as part of the regional rail build-out; rather, they can be added later as demand grows.

## **Boston-Newton**

**West Station:** The proposed West Station, for which preliminary work is underway, is essential to the success of the Allston Landing project, ensuring that residents, employees, and visitors can quickly reach the complex by transit. High-quality transit access, ensuring that residents, employees, and visitors can arrive by transit, would enable Allston Landing itself to be denser and more walkable, with less parking. For these reasons, we support an early build mainline rail station, even prior to electrification if possible. Future additional improvements will enable improved transit connections to Kendall Square and the Longwood Medical Area.

Harvard University and Boston University have pledged a combined \$100 million for West Station; with cost control measures, this can cover a portion of the full station cost. Avoiding overbuilding while building connecting infrastructure is crucial to getting the station built quickly. One way to value engineer the project is to forgo an express track through the station; given the anticipated density of the Allston Landing neighborhood and connectivity options, it is useful for all trains to stop there.

**Faneuil/Parsons Street:** Until 1959,<sup>15</sup> a station called Faneuil existed near Brooks and Parsons streets. Building a station roughly at the same location would provide access for residents who must currently take long bus or auto trips to reach Boston's core. There are currently 3,960 jobs within a half-mile radius, as well as a planned lab development, providing an opportunity for a private contribution to construction. The Route 64 bus passes the site, facilitating a connection to Oak Square. With additional pedestrian improvements, including a new pedestrian bridge, it would also be possible to reach the station from Arsenal Yards in Watertown in less than 5 minutes by walking.

**Newton Corner:** Also the site of a previous station closed in the 1960s, a Newton Corner station would serve nearly 4,000 nearby jobs and 3,000 employed workers and provide a faster trip between Watertown and Downtown Boston and the Back Bay via a bus transfer. A number of busy bus routes stop at Newton Corner, some of which continue onto the Mass Pike into Downtown Boston. In conjunction with Regional Rail frequency and free transfers, curtailing these routes at Newton Corner would provide riders with a faster, more reliable trip to downtown and Back Bay. Buses that currently waste revenue hours in traffic could instead turn at Newton Corner or continue south of the Mass Pike, increasing connectivity and frequency.

However, construction on the original station site will be difficult and expensive due to the presence of I-90 and a hotel built over the right of way. We recommend a cheaper alternative to the historic site just east of the Washington Street bridge, near St. James Street.

## **Framingham-Worcester**

**Westborough Center:** Westborough was originally served by a station in its town center; when service to Worcester was restored, Westborough's station was instead built nearly two miles west of the town center to serve park-and-ride commuter traffic. The current station site has little development nearby and only 400 walkable jobs. We recommend relocating the station back to its historic site, which is located in a more walkable environment and serves over 2,000 jobs. Although parking opportunities would be more limited, the station's site in a historic downtown would reduce dependence on driving and expand TOD opportunities, bringing wider economic and social benefits to the entire town of Westborough. Park-and-ride demand could be met by future service to Marlborough, discussed below.

<sup>15</sup> [Article clipped from The Boston Globe - Newspapers.com™](#)

**Millbury/Route 20:** Early plans for restoring commuter rail service to Worcester included a station in Millbury near Route 20. With EMU acceleration and trains from Worcester running express from Framingham, this idea ought to be revisited. This station would be mostly auto-oriented, but a park-and-ride opportunity here could encourage use of the Framingham/Worcester Line, including the opportunity to reach Downtown Worcester without driving.

**Worcester Shrewsbury Street/UMass:** A station located near the intersection of Shrewsbury Street, Plantation Street, and Route 9 would serve over 4,100 jobs. This is more than any station on the line's western portion save for Union Station itself, with UMass Chan Medical School, several biotech labs and a variety of businesses. The station would connect to WRTA Routes 15 (serving Shrewsbury Street and Shrewsbury) and 24 (serving Belmont Street/Route 9), and be within walking distance to Route 16 (serving Lake Street).

### **Longer-Range Intercity Service: East-West Service and Compass Rail**

East-West rail service linking Springfield, Worcester, and Boston is an important and overdue infrastructure project for the Commonwealth. The Commonwealth's planning efforts for East-West rail have recently taken on a welcome focus with the \$108 million award of a federal CRISI grant for infrastructure upgrades.<sup>15</sup> Following the CRISI award, MassDOT announced plans for additional service west to Albany and south to Connecticut, centered around Springfield and improved East-West connectivity.<sup>16</sup>

With early efforts bearing fruit, we urge MassDOT and others to set achievable, realistic goals in line with our 90 to Springfield program of investments. We continue to believe that a 90-minute trip between Boston and Springfield—a travel time competitive to any other mode—is a feasible medium-term goal and a minimum threshold for what constitutes meaningful intercity rail service.

East-West service to Springfield and Regional Rail for the Framingham/Worcester line are fundamentally complementary efforts. Successful intercity rail requires high-quality infrastructure, reasonable speeds, reliable service, and many of the other hallmarks of regional rail, including high-level platforms. In particular, the Worcester Triple Track project and superelevation along the line will make this corridor more suitable for intercity rail service.

Assuming full electrification and other improvements such as track banking improvements, we recommend half-hourly service up to Springfield.

As with the Worcester Line, TransitMatters believes that the electrification of intercity rail to Springfield is key to meeting service standards and advancing a modern transportation system.

### **Speed Improvements**

The maximum speed on most of the line is currently 60 MPH. However, the MBTA has recently upgraded the limit to 79 MPH in places where track has been upgraded.

Most of the line can support 90 MPH and some segments are straight enough for 100. Between Allston and Framingham, the tightest curve (at Riverside) permits 87 MPH provided trains can take it at modern speeds. Railroad tracks can be banked (known as superelevation on the railroad) to facilitate taking curves at speed. The line's curves currently have weak levels of banking which can be increased significantly. Moreover, federal regulations for train speed on curves were modified at the beginning of this decade allowing trains to run faster subject to tests; unfortunately, the MBTA is still not making use of the new rules.

<sup>15</sup> [Officials Announce \\$108 Million Federal Grant to Build East-West Rail - Streetsblog Massachusetts](#)

<sup>16</sup> <https://mass.streetsblog.org/2023/10/18/massdot-outlines-compass-rail-vision-for-new-passenger-services-to-western-mass-albany>

## Grade Separation

The Framingham/Worcester Line is largely grade-separated, but there are a few grade crossings. Grade separation is expensive, on the order of hundreds of millions of dollars in built-up areas; as such, we generally instead recommend upgrading crossings with quad gates to provide enhanced protection.<sup>17</sup> However, at least one significant grade separation project is needed to run Regional Rail frequencies, in downtown Framingham. While the project will be expensive, it will pay strong dividends in terms of better rail frequency and development opportunities in downtown Framingham.

Downtown Framingham has two at-grade crossings: at Concord Street (State Route 126), and Bishop Street, which hinders transportation for all modes of transportation. With Regional Rail, trains would run through Framingham at least every 7.5 minutes per direction during rush hour. This would result in a crossing closure in a dense downtown just under every 4 minutes at rush hour, disruptive not just to private automobile traffic but to pedestrians, bikers, transit users, and restocking deliveries as well; it also makes the train schedule fragile in the event of a disruption, which becomes more likely at busier crossings.

The Concord Street/Waverley Street intersection in particular has been a concern to the City of Framingham for a century: there have been nearly 40 studies of the grade separation of Route 126, the latest noting that elevating or depressing the roadway would hinder pedestrian access and is cost-prohibitive in such a constrained environment.

Instead, we propose grade-separating both intersections by elevating the railway line, which improves access for all modes of transportation and improves train service at the same time. Modern elevated rail lines are built with concrete, rather than steel, to avoid excessive noise commonly associated with elevated lines in Chicago and New York City.

The ramps required for grade separating the rail line would require relocating the existing Framingham station – as the station is currently next to a lake, this is an opportunity to bring the station closer to the downtown, which would make it more accessible to the city and serve more jobs. At the same time, this would free up land near the lake to be redeveloped as both parkland and building space that can help pay for the construction of the new station.

The new station would be relocated to between Concord Street and Bishop Street, providing access to both intersections. It would be closer to the MWRTA bus hub and Framingham City Hall.

Moreover, relocating the station operationally improves train service. It enables future passenger service along the Agricultural Branch rail line towards Framingham State University and Saxonville, with large student populations and high job densities, and providing connections across Framingham with potential extensions to Marlborough, Northborough and Clinton. It also enables seamless cross-platform transfers between local and express trains between Worcester and Boston.

<sup>17</sup> For instance, [a grade separation project on Caltrain in the San Francisco Bay Area](#) cost just over \$200 million in 2021 dollars, though \$25 million is attributable to project delays that ought to be avoided to the fullest extent possible.

While it is theoretically possible to have the train line go either underground or aboveground, we recommend elevating the line rather than tunneling. There are multiple advantages to elevating the line:

- » It is much cheaper and faster to build above ground with fewer disruptions to all modes of transportation within the city.
- » Above-ground stations tend to have better air quality and be brighter and less gloomy. This may also improve wayfinding from the station and promote trips to the City of Framingham, providing an important economic development bonus
- » It is cheaper to maintain, and there are fewer construction risks. Tunneling is risky both in terms of cost and the risk of caving, particularly in an urban context and next to a large water body.

## Funding Sources

Significant federal funding is available for infrastructure projects. At the same time, much of this funding is awarded on a competitive basis, and the Commonwealth finds itself competing against jurisdictions that have invested significant monies of their own into ongoing infrastructure projects. Federal money is important and available, and has a vital role in supporting regional rail investments on the Framingham/Worcester Line. At the same time, federal money will not be forthcoming unless the Commonwealth displays a capacity to provide matching funding and deliver on infrastructure projects.

A number of the projects needed to implement and enhance Regional Rail service on the Framingham/Worcester Line are within the scope of the following grant and funding sources.

- » The [National Infrastructure Project Assistance Grants Program](#), operating under the MEGA program within the MPDG Program, offers a substantial funding opportunity for FY23. With an allocation of \$1.8 billion, this grant aims to support critical infrastructure projects.
- » The [Consolidated Rail Infrastructure and Safety Improvements \(CRISI\) Program](#) provided around 1.4 billion under the 2022 Notice of Funding Opportunity (NOFO), and has provided significant funding to the Commonwealth's early efforts on East-West Rail

## Service Planning

The dense, job-rich segment between South Station and Auburndale, particularly from Newton Corner east, would benefit from high frequency service, similar to our recommendation of 7.5 minute peak frequency on the Fairmount Line. However, the need for longer-range service complicates scheduling.

The dense, job-rich segment between South Station and Auburndale, particularly from Newton Corner east, would benefit from high frequency service, similar to our recommendation of 7.5 minute peak frequency on the Fairmount Line. However, the need for longer-range service complicates scheduling.

The line must also serve points west of Framingham, particularly Worcester, at competitive travel times and frequencies. Furthermore, East-West Rail to Springfield and beyond must be fast, and will also have slightly longer stops at stations, or dwell times - it would not be tenable for a Boston-Springfield train to make multiple stops on the urban end. Therefore, the Framingham/Worcester Line uniquely warrants three different service patterns, all sharing two tracks along a right-of-way constrained by the Turnpike from Newton to Allston:

1. Local trains, making all stops between South Station and Framingham.
2. Express trains, running nonstop from Newton Corner to Framingham, then making all stops to Worcester.
3. Interregional trains, with limited stops between Boston and Worcester, continuing to Springfield and beyond.

### **Ramifications**

Running more than one service pattern at moderate or high frequency on the same tracks requires trains of each frequency to pass or overtake the other trains running in the same direction. Schedule simulation demonstrates that the line can accommodate a frequency of 8 trains per hour, per direction (tph/d), with local trains running every 15 minutes, and express and interregional trains every 30. This schedule requires an overtake in Wellesley, which the MBTA's Triple Track project will allow.

In fact, under this scenario, the Triple Track would only need to run through Wellesley (though the West Natick high level platforms, bundled as part of the Triple Track project, remain a crucial investment).

This option provides competitive frequency and trip times for points west of Route 128 and markedly improved service on the urban end. Slowing interregional trains down by three minutes allows for a quick transfer at Framingham to and from local trains, facilitating fast transfers for riders bound for Worcester from local-only stops; even with a transfer at all times, trip times to Worcester would be faster than today. This also allows for fast connections to Worcester from MWRTA buses at Framingham. However, this limits the possible frequency on the urban end to 6 tph/d west of West Station.

Running a local and express train every 15 minutes each at rush hour, providing all-stops trains from Newton Corner east every 7.5 minutes, is feasible, but requires higher investment. The entire Triple Track from Weston to Framingham would need to be built, as well as additional passing tracks in Southborough. Interregional trains would need to be slightly slower to guarantee sufficient schedule contingency, but trip times would still be competitive from Springfield.

An additional complication is capacity at South Station. With a 10 minute turn time, we are confident that 8 tph/d from the Framingham/Worcester Line can fit across two platforms. But interregional trains may require slightly longer turn times, and might not fit on the same pair of platforms. However, it should be feasible to instead share platforms at South Station with Amtrak trains given appropriate platform assignments, assuming other capacity improvements, namely converting the Needham Line to rapid transit.

## Bus Connections

The Framingham/Worcester Line has significant bus connections in three locations - Worcester, Framingham, and Newton. Many of these buses are already well-patronized and run to a variety of activity centers. But as with the rest of the Commuter Rail network, buses generally aren't scheduled for practical train connections, and riders must pay a high fare to transfer.

Integration between buses and trains is an essential component of Regional Rail and will boost Framingham/Worcester Line ridership immensely. On the urban end, it will enhance the benefits of rapid transit-level frequency by connecting the line to destinations throughout Boston and the immediate western suburbs and speed up trips that currently use the congested Mass Pike. On the suburban and intercity ends, timed connections will provide alternatives to driving to the stations and make more reverse commutes, suburb-to-secondary city trips, and suburb-to-suburb trips viable by transit.

Integration refers to the following measures:

- 1. Free transfers between Regional Rail and bus service:** Being able to access multiple destinations on a single fare makes transit economical and reduces friction in the rider experience.
- 2. Timed or high-frequency connections between buses and Regional Rail trains:** either buses and trains must serve a given station frequently enough that the wait time between vehicles is low, or buses and trains must be timed to connect at stations where scheduling allows as many connections as possible, both between buses and Regional Rail and between buses themselves (often called pulse scheduling).
- 3. Direct service to train stations:** Wherever possible, buses should stop at Regional Rail stations.

In order to accomplish this, MassDOT and the Legislature must allocate commensurate funding to MBTA bus service and Regional Transit Authorities (RTAs). But just as important is operational coordination between rail and bus operations.

## Worcester

The Worcester Regional Transit Authority (WRTA) serves Worcester's downtown and metro areas with over 25 bus routes, almost all of which converge on its Hub Center terminal, a 3-minute walk from the Union Station platform. While Union Station is within walking distance to many jobs, WRTA routes connect to outlying employment centers such as the UMass and Worcester State Medical Centers and northern parts of Downtown Worcester that are unwalkable from Union Station. They also serve dense portions of the city far from the rail line, such as the Oak Hill area. Fortunately, buses already run seven days a week. Some routes are frequent during weekdays - Route 19, serving the southwest side of Worcester, runs every 15-30 minutes. However, schedule connectivity between trains and buses is poor.

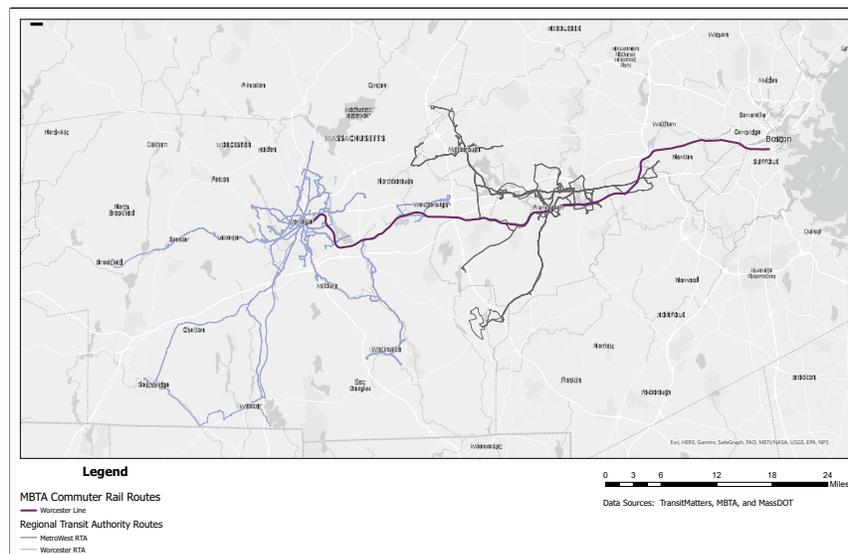
In the short term, some routes' schedules can be optimized to provide better rail connections. But the ultimate solution is a pulse approach. Buses should run at a minimum half-hourly on all routes and every 15 minutes on busier ones, timed to arrive at the Hub Center in enough time for riders to transfer to Regional Rail and vice versa. This will also improve connectivity within the WRTA service area by improving transfers between buses. This tight scheduling will require measures such as transit signal priority and bus lanes.

Infill stations within Worcester and potential extensions of rail service afford additional connection opportunities. Depending on transfer demand and route layout, this means that some routes can still provide fast, affordable, high-quality connections to Downtown Worcester via Regional Rail transfers, such as at Shrewsbury Street and Main-South, while instead serving outlying destinations.

## Framingham

The MetroWest Regional Transit Agency (MWRTA) runs mostly loop routes out of Blandin Hub, an approximately 10-minute walk from the Framingham MBTA station. It serves large employment hubs such as the Natick Mall and Shoppers World, as well as office parks. Many, but not all, MWRTA routes stop at Framingham Station. Over 14,000 (35%) of workers employed in Framingham commute from the east and west and more than 8,000 of them live over 10 miles away, indicating significant potential for improved bus connections to Framingham/Worcester Line trains from both directions. Routes such as MWRTA's Routes 3 and 4 South serve some of the most job-rich areas in Framingham, but the frequency is poor; the 4S has a 40-minute headway. Connections with the trains are also poor, with waits up to 15 minutes.

A bus-rail pulse requires moving the connection point for all buses from Blandin Hub to Framingham Station; with the relocation as proposed above, buses will also come close to the core of Downtown Framingham. At a minimum, buses should run and pulse at Framingham station half-hourly all day, doubled at rush hour. Given demand levels, it will not be feasible for buses to be as frequent as local and express service, but at rush hour, the wait would be short, with express trains arriving 7.5 minutes after locals. However, if interregional trains can be timed to arrive shortly after local trains, riders bound for and originating at Worcester would be able to make a timed half-hourly connection.



## Newton

Multiple MBTA bus routes connect to the line at Newtonville, West Newton, and Auburndale stations from points throughout Newton, Waltham, Watertown, Needham, and Brighton. Additionally, routes 501 and 504 cross the line at Newton Corner; Route 57, one of the system's busiest, also stops here.

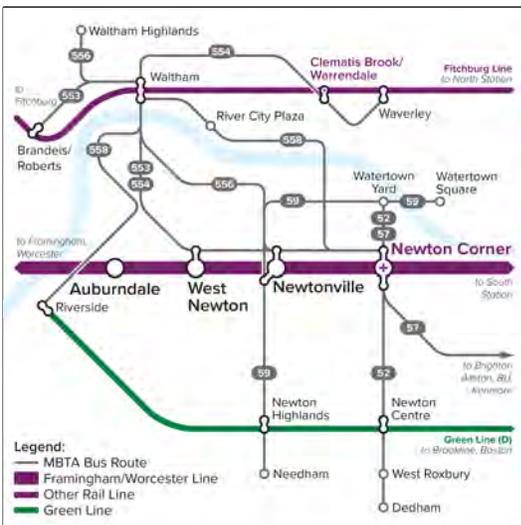
These routes run express along the Turnpike into Downtown Boston and Copley Square, respectively. An additional Turnpike express bus, Route 505, connects directly to the line at Auburndale. Pre-COVID, Route 501 ran as frequently as every 4-6 minutes at rush hour, while routes 504 and 505 had a 12-minute peak frequency. Virtually all inbound riders disembarked either Downtown or at Copley.

18 Information found in the Better Bus Project route profiles: [501 \(mbta.com\)](https://www.mbta.com), [502-504 \(mbta.com\)](https://www.mbta.com), and [505 \(mbta.com\)](https://www.mbta.com)

Particularly with an infill station at Newton Corner, Regional Rail connections to these buses would speed numerous trips and allow the MBTA to allocate service hours better. Express buses contend with Turnpike congestion, slowing trips down and compromising reliability. With a train serving Newton Corner every 10 minutes all day, and Auburndale every 15 minutes, these routes would no longer need to continue downtown. While this would eliminate one-seat rides, it would replace them with a fast, reliable trip to Downtown and the Back Bay. 504 buses could instead be deployed to run more frequent service on Route 57, while 501 and 505 buses could either terminate at Newton Corner or extend north and south, respectively, enhancing local connectivity.

Similarly, riders on the local routes connecting at the existing stations will enjoy a faster, cheaper trip to Boston and points west, and destinations on these routes will become accessible from the Framingham/Worcester Line.

In the short term, adjusting departure and arrival times on some routes can improve bus-rail connection options.



### Allston-Brighton

Further connections are possible in Allston and Brighton. Route 64, running every 15-30 minutes all day, connects Oak Square and northern Brighton with

the key employment areas of Central Square, MIT, and Kendall Square in Cambridge. It intersects the potential Parsons Street infill station at North Beacon Street and also passes near Boston Landing.

Routes 57 and 66 also pass near the line in Allston and Brighton. The 57 could benefit from a short deviation to the proposed West Station; early plans for West Station include design to facilitate dedicated bus transfers. Doing so would provide riders bound for Downtown and the core of the Back Bay with a faster trip relative to the Green Line at Kenmore while reducing crush loading on the Kenmore-Packard's Corner segment of the 57. The 66 could be rerouted to Everett Street to provide a direct connection to Boston Landing; doing so would reduce the route's circuitous nature and also provide a faster trip to Downtown and Back Bay for riders on the route, but would come at the cost of existing stops along Western Avenue.

The planned West Station bus infrastructure also affords the opportunity for improved bus connections southward. The Longwood Medical Area, one of Boston's major job centers, is slated to receive frequent, wide-ranging bus access in the Bus Network Redesign; as the redesign is being implemented, planners should consider extending some of this service to West Station.

### Future Expansion

#### Agricultural Branch

The Agricultural Branch (or "Ag Branch" is an existing railroad that runs from Framingham to Marlborough, splitting off from the Framingham/Worcester Line in a junction just east of the current Framingham station site. It is currently used by CSX for freight traffic, but we believe that this corridor has merit as a Regional Rail branch of the Framingham/Worcester Line.

Activating the Agricultural Branch for passenger service provides additional connectivity and reverse commute opportunities in the MetroWest suburbs. It also provides an operational benefit of not needing to build turnback tracks for local trains in Framingham; instead, all local trains could run along the branch. There are over 16,000 employed residents within walking or driving distance of the Ag Branch, defined as a two-mile radius, and; the closest jobs are those within walking distance of the railroad, most of which are either at Framingham State University and the Framingham Tech Park complex (6,0650). Operationally, extending local service along the Ag Branch from Framingham would allow these trains to serve more riders than they would by terminating at Framingham station.

However, there are challenges to effectively serving the reverse commute market. The job centers are oriented around automobile access and with the exception of the Tech Park, are located outside walking distance of the line. In some cases, particularly in Marlborough, it might be possible to improve access by developing better walking paths.

### **Worcester Local Service**

Mobility within and around Worcester can be significantly improved by the addition of infill stops in the area and, in the longer term, reactivation of rail lines that do not currently see passenger service.

A forthcoming white paper will address these opportunities, with a strong focus on RTA connectivity and economic access and development issues.

### **Grand Junction**

The Grand Junction railroad runs from Allston (around the proposed West Station site) through the eastern portion of Cambridge. This corridor, currently unused for revenue service,

connects job-rich Kendall Square with the Worcester line and Allston and, as such, has seen a number of proposals for passenger service.

The most significant ongoing analysis of Grand Junction passenger service possibilities is being conducted by the Cambridge Redevelopment Authority.

In line with most other analyses, CRA's proposals centers around "urban rail" service from West Station to North Station, with around three infill stops in Cambridge. This proposal is tractable and enhances connectivity from the Framingham/Worcester Line without adversely affecting its line operations.

Another frequently-discussed service model on this line is providing rail service from Worcester and Framingham to Kendall Square and North Station by running trains along the Grand Junction tracks in Cambridge. We do not recommend this service model, but we mention it in this report since it has been frequently studied.

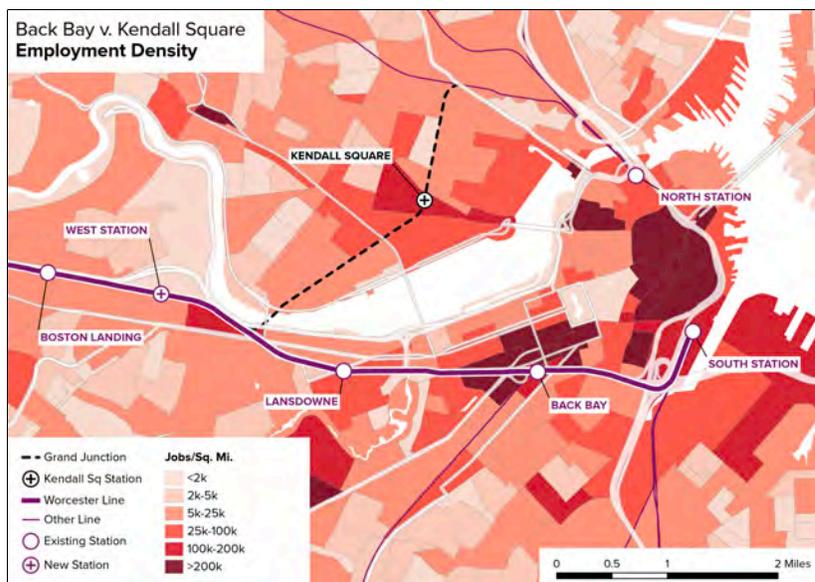
This service model would run trains from Worcester or Framingham as usual until they reach West Station in Allston, where they would switch on to the Grand Junction track, which heads northbound into Cambridge. Within Cambridge itself, there are different proposals depending on the mode suggested. Some proposals involve running existing Commuter Rail rolling stock along this line, and adding a single infill station near Kendall Square. Other proposals have suggested using Diesel Multiple Units (DMUs), which are significantly shorter vehicles that require smaller stations. With these smaller stations, the DMU proposals usually make several stops in Cambridge (usually some combination of a Cambridgeport stop, a Massachusetts Avenue stop, a Kendall Square stop, and/or a Cambridge St. stop). Regardless of the number of stops in Cambridge itself, the proposed service would then continue along the Fitchburg Line tracks into North Station.

We do not recommend this service model for several reasons.

- » Ridership potential. While Kendall Square and North Station are strong employment destinations, trains can only serve these two destinations by giving up service to Lansdowne, Back Bay, and South Station. South Station is a stronger destination than North Station, and Back Bay has considerably more jobs than Kendall Square. Ultimately, this service isn't worth the trade-offs.
- » Grade crossings. The Grand Junction has six grade crossings, most of which are on very high-traffic streets like Massachusetts Ave and Broadway. Running good service on the Grand Junction would result in these streets frequently closing down for train traffic: 10-minute bidirectional frequency would mean that a train would trigger a closure of each grade crossing every 5 minutes. The impacts on traffic would likely lead to political pressure to reduce service frequency, further depressing ridership potential. Grade separation, meanwhile, would be difficult and expensive in such a built-up area. The Main Street grade crossing, in particular, is practically impossible to grade-separate for a Commuter Rail vehicle: MIT buildings above block the possibility of an elevated viaduct, and the cut-and-cover Red Line tunnel below blocks the possibility of a rail tunnel.

- » Dispatching and timetabling effects. This service model is operationally complex from a dispatching and timetabling perspective. Trains originate on the Worcester/Framingham Line and must be timetabled to avoid conflicts with other trains on this line. Trains will then switch to the Grand Junction, which may require its own precise timetabling (especially if existing single-track segments are left single-tracked). From the Grand Junction, the trains then need to enter the Fitchburg Line tracks to get to North Station, which requires them to be timetabled to avoid conflicts with Fitchburg trains as well. The resulting service would need to be precisely scheduled and run with very high levels of schedule discipline to harmonize with both Framingham/Worcester and Fitchburg traffic, and even if this is achieved, it will likely have negative impacts on potential frequency for both lines.

Given these conditions, we do not recommend this service model for the Grand Junction. The Grand Junction right of way may have transit potential under another model, and a more direct connection between the Worcester Line and Kendall Square does have value. Thus, service along the Grand Junction should be operated separately, with connections to the Worcester Line at West Station rather than continuing onto the Worcester Line itself.



## What is Regional Rail?

MBTA Commuter Rail operates as a mid-20th century service with a mid-20th century business model. It reflects out of date biases about where people and jobs are located, and about how people desire to get from one place to another. Many people no longer work on a strictly 9 am to 5 pm weekday schedule, and many more want convenient and frequent train schedules that respond to the needs of their daily lives.

*“The current Commuter Rail paradigm costs way too much money for way too little ridership.”*

*— MBTA FMCB Chairman Joe Aiello, 11/20/17*

Our current approach to Commuter Rail, as a business model, fails to offer its rider/customers the service they want and need. As a result it contributes to the region’s worsening traffic congestion, keeps Gateway Cities isolated during most of the day, and exacerbates income inequality since the inadequate service compels many to drive – for lower income people, the high cost of owning, maintaining and driving an automobile can have a crippling effect on their ability to make ends meet.

Public transit must be frequent all day, not just at rush hour. A Regional Rail system would have trains running at least every half hour all day in the suburbs and at least every fifteen minutes in Boston and other Inner Core communities.

Regional Rail requires both frequent all day service, accessible platforms and smarter equipment to provide the service. That means high-level platforms at stations to simplify and speed up boarding and alighting. It also means electrification of the system, enabling use of Electric Multiple Units to replace the current push/pull diesel fleet. EMUs will be more reliable and less expensive to maintain, will provide riders with speedier trips, and will provide better service without polluting the air around them.

## A highly functioning Regional Rail system includes five critical components:

- » **Systemwide electrification** and the purchase of high-performance electric trains.
- » **High platforms**, providing universal access and speeding up boarding for everyone.
- » **Strategic infrastructure investments** to relieve bottlenecks.
- » **Frequent service all day**: every 30 minutes in the suburbs and every 15 minutes in denser neighborhoods.
- » **Free transfers** between regional trains, subways, and buses, and fare equalization with the subway in the subway’s service area.

## And one useful component that will complete cross-region mobility:

- » With a modern electric Regional Rail system in place, **the North-South Rail Link (NSRL)** is the next step to drastically enhance regional mobility. NSRL allows trips between any two stations through a one-seat ride or single, seamless transfer, providing the flexibility and connectivity to which many riders and potential riders would be drawn.

**MORE INFORMATION AND REPORTS AVAILABLE AT:**  
[HTTP://REGIONALRAIL.NET](http://REGIONALRAIL.NET)

<i>REGIONAL RAIL FOR METROPOLITAN BOSTON</i>	WINTER ‘18
<i>REGIONAL RAIL PROOF OF CONCEPT</i>	FALL ‘19
<i>REGIONAL RAIL PHASE 1</i>	SUMMER ‘20
<i>PROVIDENCE/STOUGHTON LINE</i>	SPRING ‘20
<i>FAIRMOUNT LINE</i>	FALL ‘20
<i>NEWBURYPORT/ROCKPORT LINE</i>	WINTER ‘21
<i>OLD COLONY LINES</i>	SPRING ‘21
<i>REGIONAL RAIL ELECTRIFICATION</i>	FALL ‘21
<i>HAVERHILL LINE</i>	FALL ‘21
<i>LOWELL LINE</i>	FALL ‘22
<i>FITCHBURG LINE</i>	FALL ‘23

## Regional Rail has 5 transformative benefits:



***Almost all commuter rail stops have poor accessibility.*** 32 are entirely inaccessible. High-level platforms provide step free access to all riders, including those with mobility constraints, parents with strollers, and riders with heavy equipment or suitcases.



***Regional Rail improvements facilitate economic growth and provide a wider customer base for local businesses.*** Frequent, reliable rail can increase development near stations. Regional Rail provides a green, economical way to access our rich cultural resources and recreational amenities.



***Modern electric trains create zero local emissions, reduce noise pollution, and increase reliability, making rail more attractive relative to car trips.*** Electrification can thus help reduce respiratory ailments in environmental justice communities, and is critical for meeting the Commonwealth's 2050 zero net emissions goals.



***Regional Rail opens up new housing markets, and makes transit-oriented development more attractive.*** Workers who commute some or all days of the week can use the train for other longer trips, and walk or bike to local destinations. Frequent, reliable, and affordable rail service opens up new employment opportunities, particularly in Gateway Cities, which are well positioned to become employment centers in their own right.



***Frequent, reliable, and affordable rail service opens up new employment opportunities.*** Regional Rail both reduces the “spatial-skills mismatch” that holds back employment, and provides access to vocational opportunities to boost workers’ skills. Regional Rail itself will provide up to 250,000 direct and indirect jobs during construction.



62 SUMMER ST, BOSTON, MA 02110  
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