

A Better Fairmount Line:

Rapid, Reliable Transit For Dorchester and Mattapan

Introduction

This report analyzes the advantages of potential infrastructure and service improvements for the MBTA's Fairmount Line, proposing upgrades and changes along its corridor. This updated version of an appendix to our first Regional Rail report, *Regional Rail for Metropolitan Boston* was a collaborative effort among TransitMatters members, led by Alon Levy, Jay Flynn, Peter Brassard, and Ethan Finlan. In November 2019, the MBTA's Fiscal Management and Control Board (FMCB) identified the Fairmount Line as an early target for Regional Rail improvements. The City of Boston has identified further improving the Fairmount Line as a key transportation priority. Eight new trips were added in May 2020, and in response to the line's ridership needs during the COVID-19 pandemic, service is planned to run every 45 minutes this year. TransitMatters applauds these decisions and the decades-long work of advocates towards improving this vital link to economic and social opportunity. The purpose of this report is to emphasize the importance of a speedy transition away from the commuter rail model that consistently fails residents of Dorchester and Mattapan.

We wish to acknowledge the following TransitMatters members who contributed to this report:

- » Jason Frost
- » David Dimiduk
- » Jack Spence
- » Jackson Moore-Otto
- » Andrew Riedl
- » Grecia White
- » Elizabeth Martin
- » Asher Smith

Design:

- » Tim Lawrence
- » Zak Koehler



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.

Learn more & download other Regional Rail reports at: <http://regionalrail.net>

Current Situation

The Fairmount Line runs for nine miles from South Station to Readville, primarily through the Dorchester, Mattapan, and Hyde Park neighborhoods of Boston, with eight stations. Five of these stations were added within the 2010s. The most recent addition, Blue Hill Avenue near the center of Mattapan, opened in 2019. Considerable upgrades have already been made to the Fairmount Line's infrastructure, with many bridges replaced and high-level platforms installed at all stations other than Fairmount and Readville.

As of 2017, between 6,000 and 9,000 residents who live near the Fairmount Line work in and around Downtown Boston. Most would be able to walk to the train at both ends, and the rest would have a free transfer to the Red Line at South Station.¹

Historically, ridership on the Fairmount Line was low, but it has tripled since 2012, when the MBTA moved all stations except Readville into Zone 1A (charging subway fare), added four infill stations, and heavily marketed the line in Dorchester.² An additional experiment with free fares for two weeks in 2017 showed more latent demand, increasing ridership by 25-44%, even though service still ran only every 40 minutes at rush hour and 60 minutes in the middle of the day.³ Nonetheless, ridership remains relatively low: according to the latest counts, the Fairmount Line has only 2,652 daily riders as of 2018, or roughly two percent of overall commuter rail ridership.⁴ Yet the evidence is clear: the line's usage grows with higher frequency and lower fares. With high frequency, free transfers, and higher speeds, the Fairmount Line will function as effectively a fifth subway line.



Image Credit: The Boston Foundation

In May 2020, the MBTA installed portable Charlie Card fare readers at every station except Readville, allowing for free transfers to buses and the Red and Silver lines at South Station. We applaud this step towards a Regional Rail operating model on the Fairmount Line. While it will take time for rail ridership to recover from the COVID-19 crisis, we expect this change to raise Fairmount Line ridership well above pre-crisis levels.

A push to make the Fairmount Line useful for local residents has been a long-needed ask from community activists. The goal has been “a hybrid of a new type of urban transportation,” said Mela Cardosa-Bush, in discussing the vision for the Fairmount Line in 2013, overcoming the historic paradigm that service passing through Dorchester “is going somewhere that’s not for them, that’s the purple train.”⁵ To that end, we offer this analysis as a means of finishing the job on this important corridor.

¹ Analysis performed via U.S. Census' Longitudinal Employer Household Dynamics OnTheMap database.

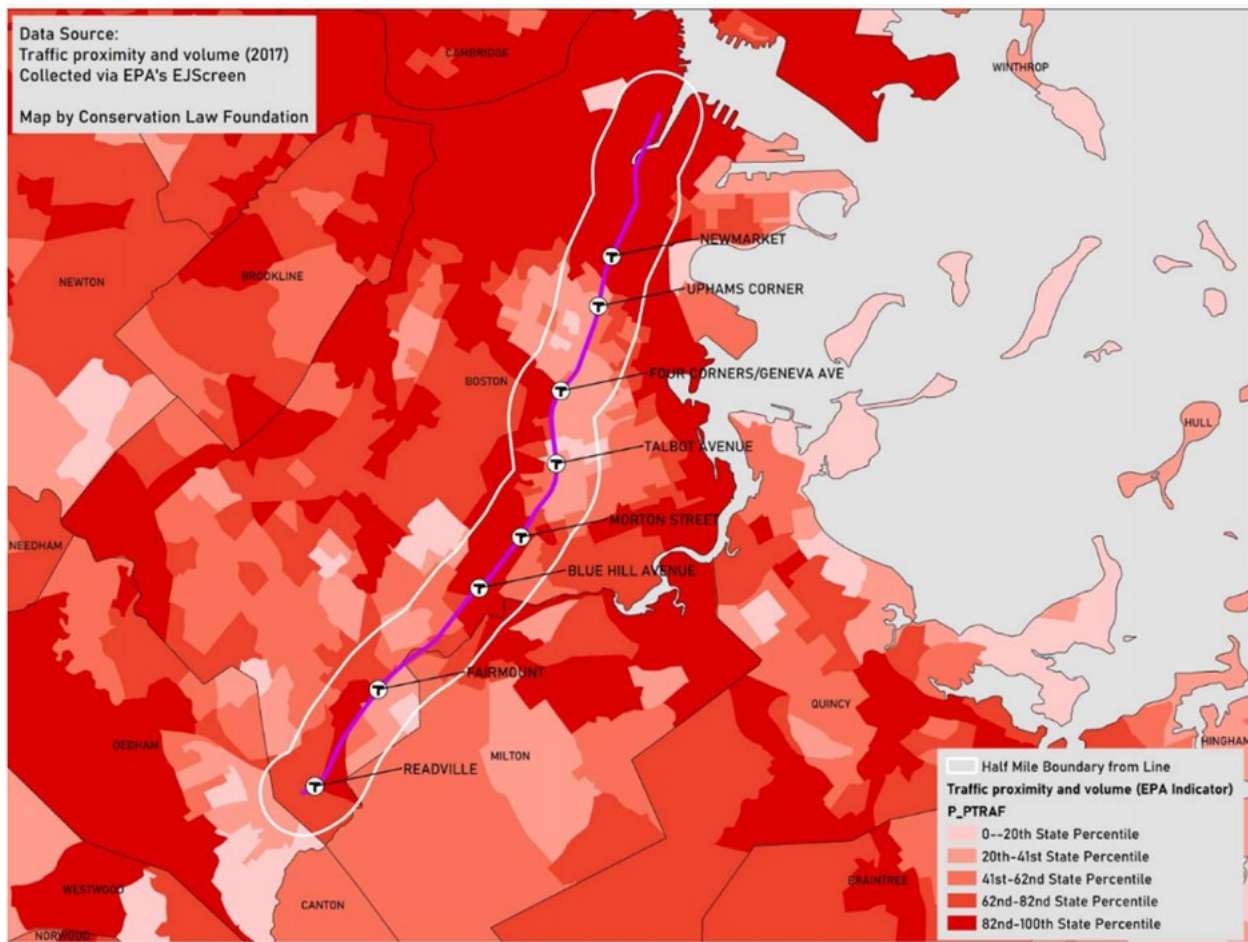
² Nicole Dungca, “Fairmount Line ridership has tripled since 2012, study finds.” *The Boston Globe*, April 4, 2017. <https://www.bostonglobe.com/metro/2017/04/26/fairmount/p9VokrkJUAQZidBAfUil4K/story.html>

³ MBTA Releases Sponsored Fairmount Line Service Data.” MBTA, June 16, 2017. <https://www.mbta.com/news/2562>

⁴ Except where otherwise noted, all ridership data is sourced from the Central Transportation Planning Staff's (CTPS) 2018 Commuter Rail Ridership Counts, the most recently available data. The findings relative to Fairmount and other lines are discussed in detail in the following MassDOT presentation: “Commuter Rail Ridership Counts,” January 28, 2019. <https://www.scribd.com/document/398648878/2019-01-28-Fmcb-Commuter-Rail-Ridership-Original-1>

⁵ “BNN Interviews Marilyn Forman and Mela Cardosa-Bush.” <https://www.youtube.com/watch?v=aE5BKqkNEcs>

FIGURE 1: TRAFFIC PROXIMITY TO THE FAIRMOUNT LINE



As this map demonstrates, high traffic volumes are present along the Fairmount Line. This impacts pollution in the air and also is indicative of long travel times. (Image Credit: Conservation Law Foundation)

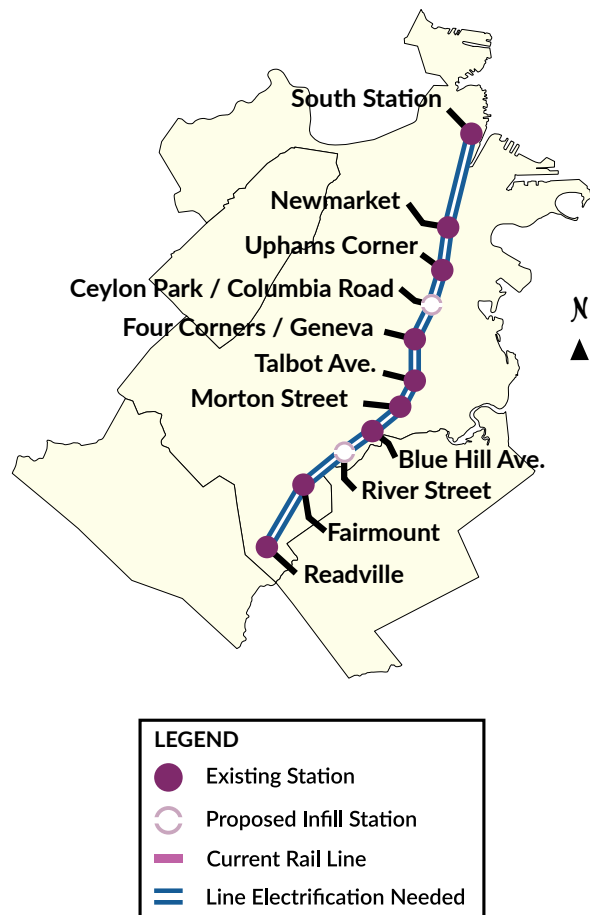
Line Characteristics and Needed Improvements Summary

The Fairmount Line is unique among MBTA Commuter Rail lines in that its service area is entirely urban.⁶ The line, originally known as the Dorchester Branch, spans approximately nine miles between South Station and Readville.

All stations on the line are in the City of Boston (a short portion of the line itself runs through the Town of Milton), and all except the outermost two, Fairmount and Readville, have full-length high platforms, built in the last few years as part of the modernization plan.

The Fairmount Line intersects the Franklin Line at Readville. Historically, the Fairmount Line and Franklin Line operated as one line while under the ownership of the New York and New England Railroad. Today, most Franklin Line trains run between Readville and South Station along the route of the Providence Line, which offers a faster trip. Some scheduled trains do continue to use the Fairmount Line, typically skipping most stops, to prevent congestion on the Northeast Corridor (NEC) main line shared by Providence, Stoughton, Franklin, Needham, Amtrak, and eventually South Coast Rail trains.

FIGURE 2: MAP OF ELECTRIFICATION IMPROVEMENTS



“One fifth of the population of Boston, 83 percent of whom are black or Latino, lives within 1/2 mile of the line. Currently, these residents face barriers to accessing rapid public transit, pushing them into cars, underfunded and inefficient buses, and driving congestion. Reducing public transportation travel times to and from the job centers in Boston and along the waterfront means more economic opportunity, a larger pool of housing choices for commuters, and less reliance on fossil fuels.”

-Marilyn Forman and Sen. Nick Collins, Dorchester Reporter article (2020)⁷

⁶ In 2019, the MBTA began running regular rush hour round trips to and from Foxborough on weekdays. At the time of publication, results from the pilot are too preliminary to make very reliable deductions. While ridership is not yet significant, this may change with time. Anecdotal reports of earlier peak parking lot usage in Norwood are common, and some stations on the Franklin Line have had service cut to accommodate Foxborough runs. Further data is necessary to show whether the ridership is worth the expense of Regional Rail upgrades on this line.

⁷ “Commentary: Regional Rail boosts mobility, equity, environmental justice.” *Dorchester Reporter*, February 27, 2020. <https://www.dotnews.com/2020/commentary-regional-rail-boosts-mobility-equity-environmental-justice>

To implement a Regional Rail operating model on the Fairmount Line, the following capital investments and operations improvements are required:

- » Fare integration with the buses and subway as currently being piloted,
- » High frequency: a train at least every 15 minutes every day, running as long as the subway system does
- » Electrification: hooking into the existing substations at both ends to wire the line cheaply, and purchasing electric multiple unit (EMU) trains,
- » High platforms at Fairmount and Readville to reduce dwell time and allow the use of EMUs without provision for low level boarding

The entirety of the line is double tracked, and portions are wide enough for four tracks. However, the terminal at Readville, on a grade-separation over the Northeast Corridor, is single track. It is possible to schedule trains every 15 minutes with a single-track terminal: in Vancouver, the SkyTrain Canada Line has single-track ends at both of its outer branches, each having a train every seven minutes at the peak. However, this imposes operational constraints elsewhere on the line, and so it may be desirable to double-track this terminal, especially if frequency is to be greater than every 15 minutes.

The Importance of High Frequency

The line’s urban setting makes high frequency imperative. While Regional Rail necessitates increased frequency throughout the system, the time between trains, or headways, on urban segments should be particularly high, especially where the line operates in high-density neighborhoods. The Fairmount Corridor has some of the lengthiest trip times in all of Boston; it is not acceptable for an urban rail line through such a corridor to run at half-hourly frequencies, let alone hourly.

The Fairmount Line can and should have a train every 7.5-10 minutes, or 6-8 trains per hour (tph), all day.

The ultimate goal must be subway-like service. The Fairmount Line can and should have a train every 7.5-10 minutes, or 6-8 trains per hour (tph), all day. This will require double tracking the terminal at Readville, which is currently single-tracked. But with an initial 15-minute frequency, trains can be scheduled around the Readville single track.

FIGURE 3: THE PATH TO REGIONAL RAIL TRANSFORMATION

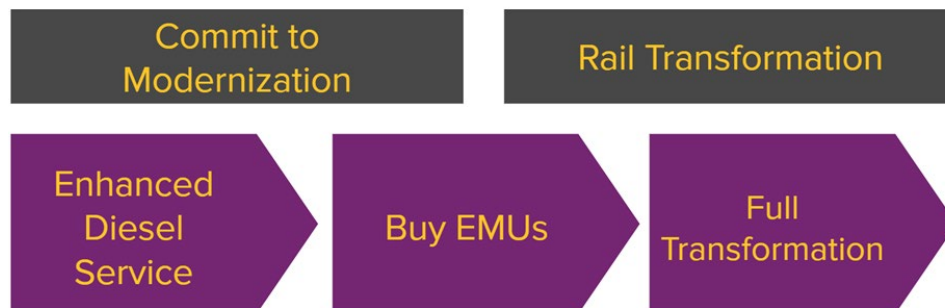
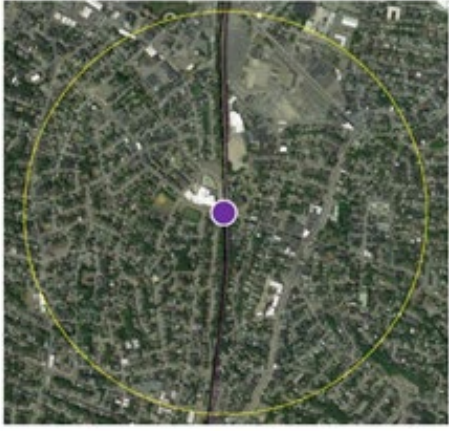
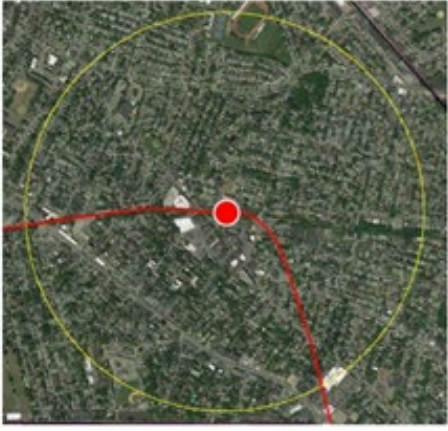


FIGURE 4: UPHAMS CORNER VS DAVIS SQUARE

Uphams Corner	Davis Square
	
<ul style="list-style-type: none"> ▪ Population: 21,000 ▪ Employment: 5,500 	<ul style="list-style-type: none"> ▪ Population: 20,500 ▪ Employment: 6,000
<ul style="list-style-type: none"> ▪ Fairmount Line Boardings: 166 ▪ Bus Lines: 8, 10, 15, 16, 17, 41, 45 ▪ Bus Boardings: 5,080 ▪ Daily Transit Ridership: 5,246 	<ul style="list-style-type: none"> ▪ Red Line Boardings: 12,857 ▪ Bus Lines: 77, 80, 83, 87, 88, 89, 90, 94, 96 ▪ Bus Boardings: 5,238 ▪ Daily Transit Ridership: 18,095

Density

Although the Fairmount Line has sometimes been maligned for low ridership, this is in fact an artifact of poor service relative to the density and needs of the corridor. A 2017 study by the renowned consulting firm Nelson/Nygaard, commissioned by the Boston Foundation, found that the station areas compared favorably to certain Red and Orange Line station areas. The study cited three station pairs: Uphams Corner and Davis Square, Talbot Ave and Green Street, and Readville and Braintree. The most striking example is Uphams Corner, a major commercial center in Dorchester a few stops from downtown. Uphams Corner actually has more residents in a half-mile radius than Davis Square, the busiest station on the Red Line north of Harvard. The two even have similar employment figures and bus boardings. In terms of rail ridership, the biggest difference between Uphams Corner and Davis Square is that the former has fewer trains and longer trips.⁸

In terms of rail ridership, the biggest difference between Uphams Corner and Davis Square is that the former has fewer trains and longer trips.

The Fairmount Line also serves several jobs directly. For instance, Uphams Corner is in close proximity to an Eversource power plant, but it is hard to access via transit. Combined with better frequency, last-mile shuttle connections or even rerouted MBTA bus routes would better connect the line to this underserved job hub. Furthermore, Newmarket station serves one of Metro Boston’s primary industrial and logistics hubs, as well as the large mall at South Bay Center; connections can be made to Boston Medical Center and the Back Bay via the Route #10 bus.

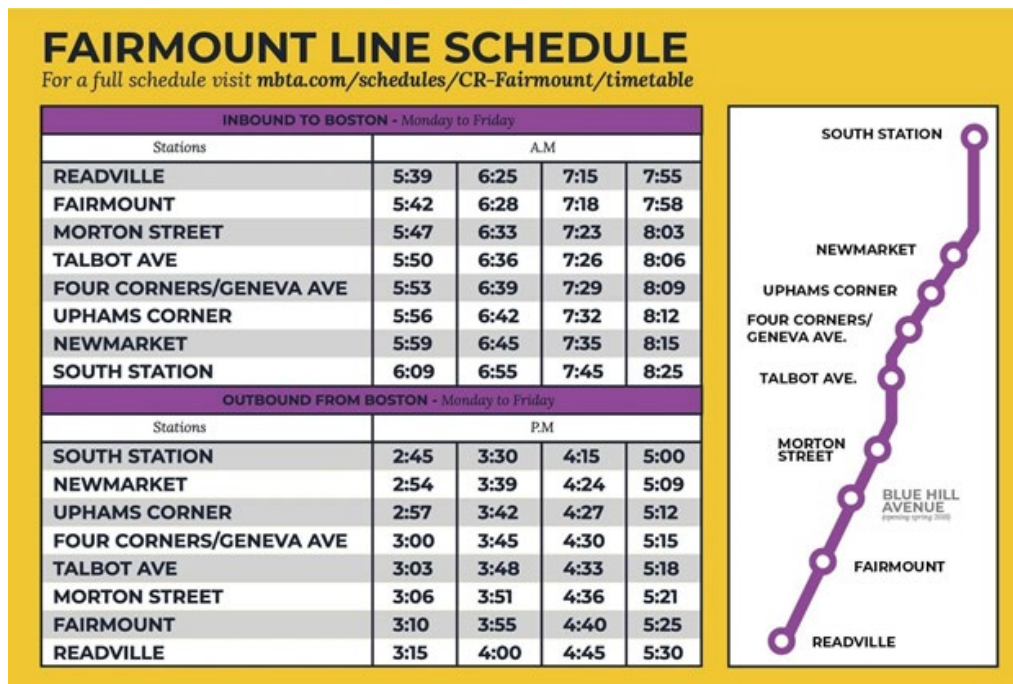
8 “Increasing Ridership on the Fairmount Line.” The Boston Foundation. <https://www.tbf.org/-/media/tbforg/files/reports/increasing-ridership-on-the-fairmount-line.pdf>, p. 40.

Step One: Enhanced Diesel Service

In 2020, the FMCB approved a pilot of frequency improvements to the Fairmount Line first proposed by the City of Boston and the Fairmount Indigo Transit Coalition. Eight additional daily trips (four trains per day to South Station and four to Readville) will be opened to passenger service between South Station and Readville. These trains currently run as deadhead trips, with the purpose of moving equipment to and from Readville Yard. As discussed below, electrification and the purchase of EMUs is necessary to achieve the line's full potential and improve air quality. Nonetheless, we welcome this pilot program as an incremental step towards high all-day frequency, as any frequency increase will have near-term benefits. However, we caution that the existing equipment's poor reliability may reduce the effectiveness of increased frequency.

We estimate that three trainsets would be needed to run trains half-hourly; four trainsets would be needed to provide service every 20 minutes, and there may be enough non-revenue trips on the line to enable this level of service via existing trips. All new schedules must operate in a clockface manner.

FIGURE 5: FAIRMOUNT LINE SCHEDULE, FALL 2020

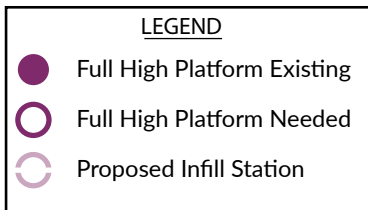
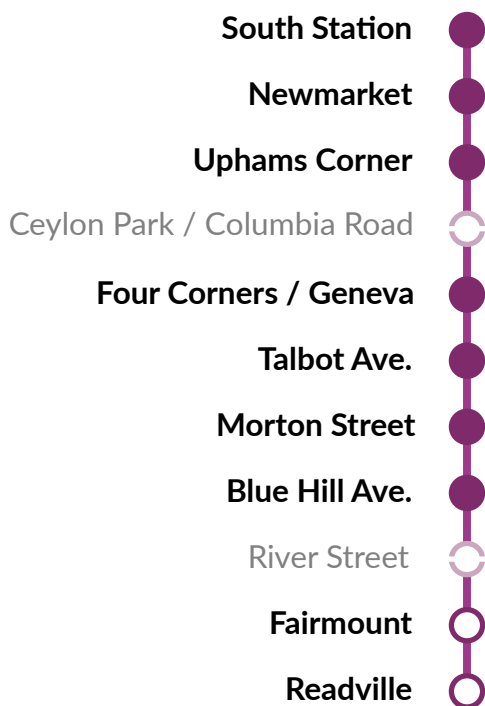


The new schedule adds new options, including for students going to and from school. Regional Rail will ultimately mean that riders won't need to memorize schedules. (Image Credit: City of Boston)

High Level Platforms:

To ensure that these trips are fast and reliable, the T should prioritize building high-level platforms at Fairmount and Readville, the only stations on the line which presently lack them. This is included among our Phase One priorities, at a cost of \$40 million. At South Station, as with all other lines, Fairmount Line trains should be assigned designated platforms as soon as possible.⁹

FIGURE 6: DIAGRAM OF NEEDED HIGH LEVEL PLATFORMS



Electrification: An Urgent Need

At both ends, the Fairmount Line connects to the Providence Line, which is already electrified. Thus, it does not need electrical substations; electrifying the line merely requires stringing wire and connecting it to the Providence Line’s substations. Electrification is a priority for the Fairmount Line to reduce the high levels of air pollution in Dorchester and Mattapan. Electrification will support increased reliability and frequency while cutting the end-to-end trip time down from 30 minutes to 18. Based on Amtrak electrification costs, we estimate that electrification of the Fairmount Line would cost \$45 million. However, if the project is completed in line with best practices from outside the United States, the cost could be lower, in the \$20-40 million range or even less since no substation construction is necessary.

Public Health and Noise Reduction

Public health data show that the residents of Dorchester contend with high levels of air pollution. For example, a city public health study finds that Boston’s worst asthma rates are in Dorchester and Roxbury.¹⁰ There are multiple reasons for this, and we do not suggest that rail electrification alone will be sufficient to solve long-standing environmental injustices. However, diesel emissions are a significant source of air pollution and an exacerbating factor for a variety of health conditions. As the maps below demonstrate; air quality along the Fairmount corridor is demonstrably poorer than much of the rest of Boston.

Boston’s worst asthma rates are in Dorchester and Roxbury.

⁹ See the *Regional Rail Proof-of-Concept* (2018) for further discussion on the importance of dedicated platforms.

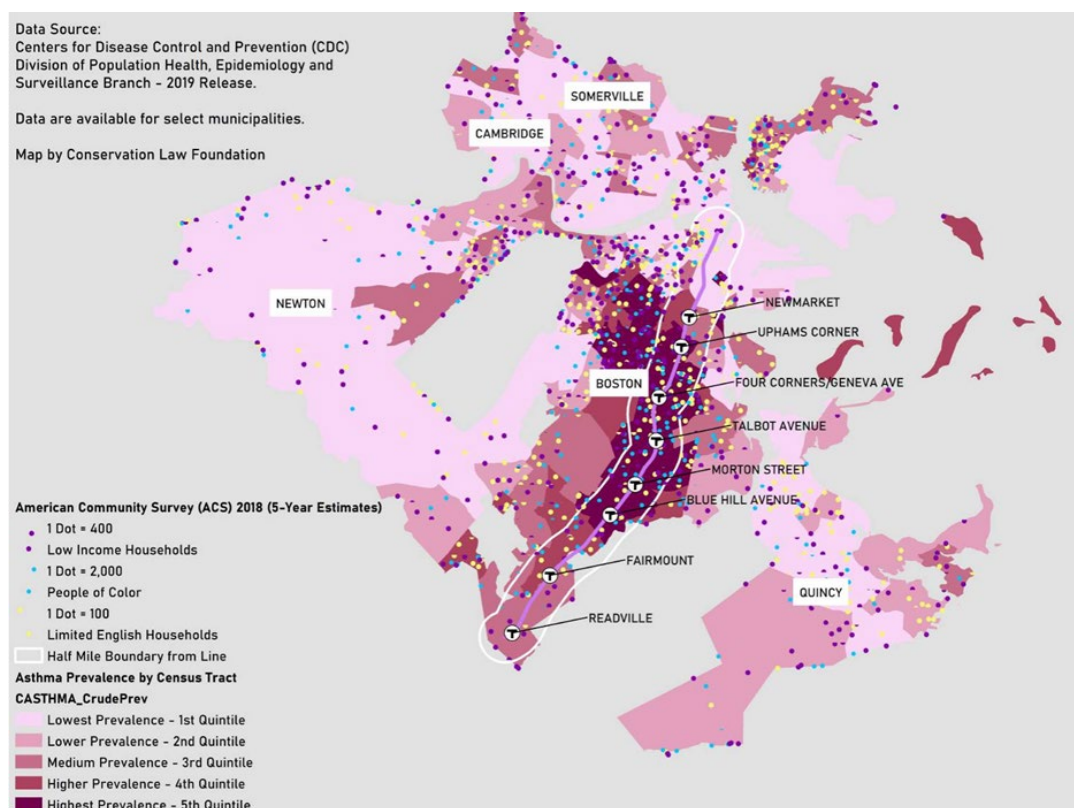
¹⁰ “Chapter 4: Environmental Health”. Boston Public Health Commission. https://www.bphc.org/healthdata/health-of-boston-report/Documents/7_C4_Env%20Health_16-17_HOB_revised%20Feb%202019.pdf, pp. 15, 17

The improvements we call for will reduce pollution in two ways. First, electrification would remove all diesel pollution from existing locomotives even with large increases in rail service. Combined with a transition to battery electric buses with in-motion charging (IMC) capability along the Fairmount corridor, electrified Regional Rail would eliminate the majority of the MBTA's emissions in this high-pollution corridor.¹¹ Second, better rail service to points south would incentivize people to switch from driving on I-93 to riding mass transit. A single car pollutes less than a train or a bus, but hundreds of cars removed from the road as drivers leave them at home and take the train represents a substantial decrease in pollution.

The Boston neighborhoods most affected by the coronavirus are also the ones with the longest-standing air quality issues, including the neighborhoods served by the Fairmount Line.

The importance of reducing air pollution in communities like Dorchester and Mattapan has been vividly demonstrated during the ongoing COVID-19 pandemic. The Boston neighborhoods most affected by the coronavirus are also the ones with the longest-standing air quality issues, including the neighborhoods served by the Fairmount Line.¹² A working Harvard University study has found that people exposed to more air pollution were more likely to die from the coronavirus.¹³

FIGURE 7: ASTHMA PREVALENCE ALONG THE FAIRMOUNT LINE



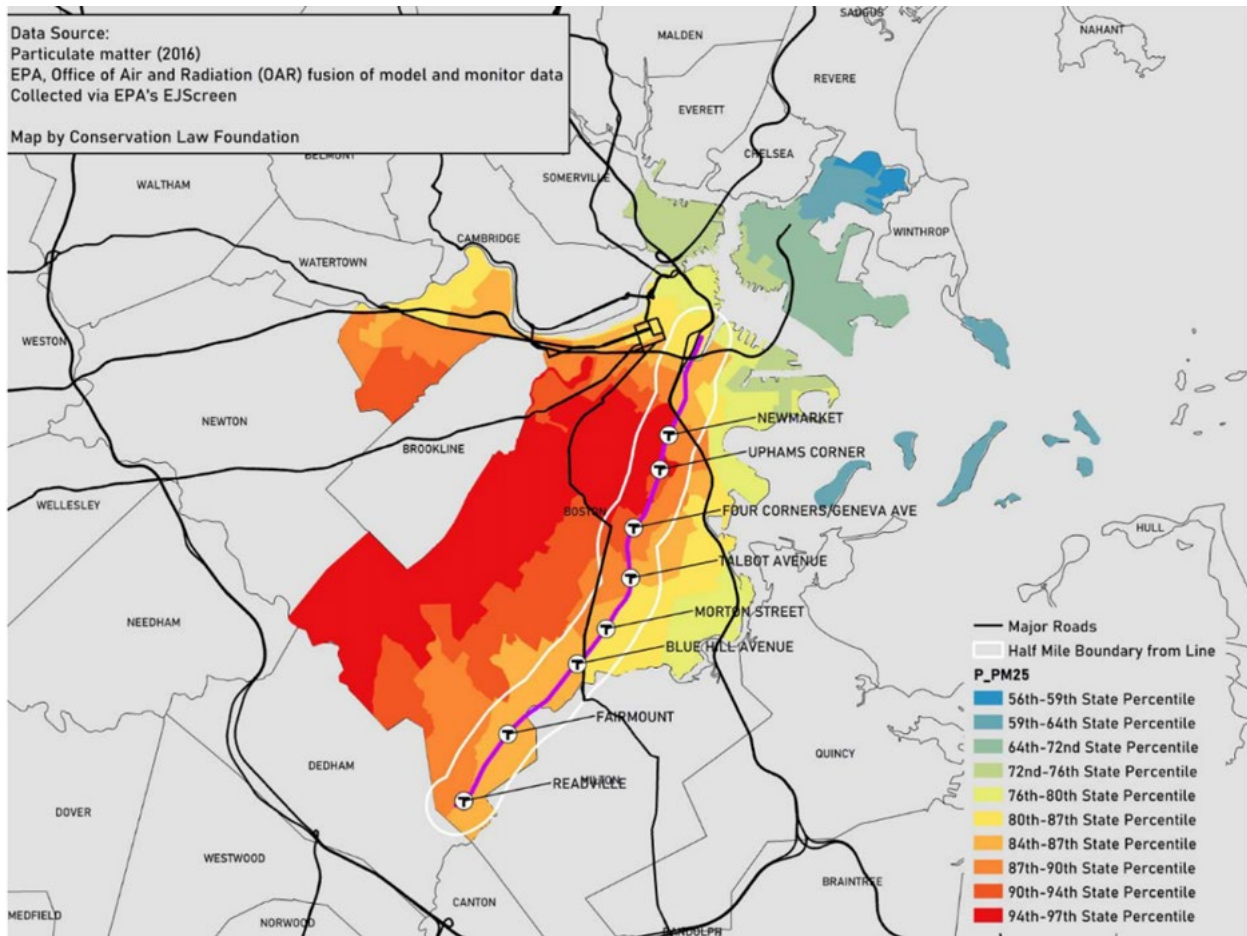
Map of asthma incidences in Boston. The section of the Fairmount Line between Blue Hill Ave and Uphams Corner has the highest prevalence. (Image Credit: Conservation Law Foundation)

11 A forthcoming TransitMatters report will focus on defining and advocating for In-Motion Charging for the MBTA's bus system.

12 Shannon Dooling, "Why Some Boston Neighborhoods Have Been Hit Harder By The Pandemic." WBUR, April 30 2020 <https://www.wbur.org/news/2020/04/30/covid-19-coronavirus-boston-neighborhoods>

13 Wu, X., Nethery, R.C., Sabath, M.B., Braun, D. and Dominici, F., "Air pollution linked with higher COVID-19 death rates." <https://projects.iq.harvard.edu/covid-pm>

FIGURE 8: PARTICULATE MATTER ALONG THE FAIRMOUNT LINE



Particulate matter along the line. As this map demonstrates, the areas near the line skew higher in particulate emissions. (Image Credit: Conservation Law Foundation)

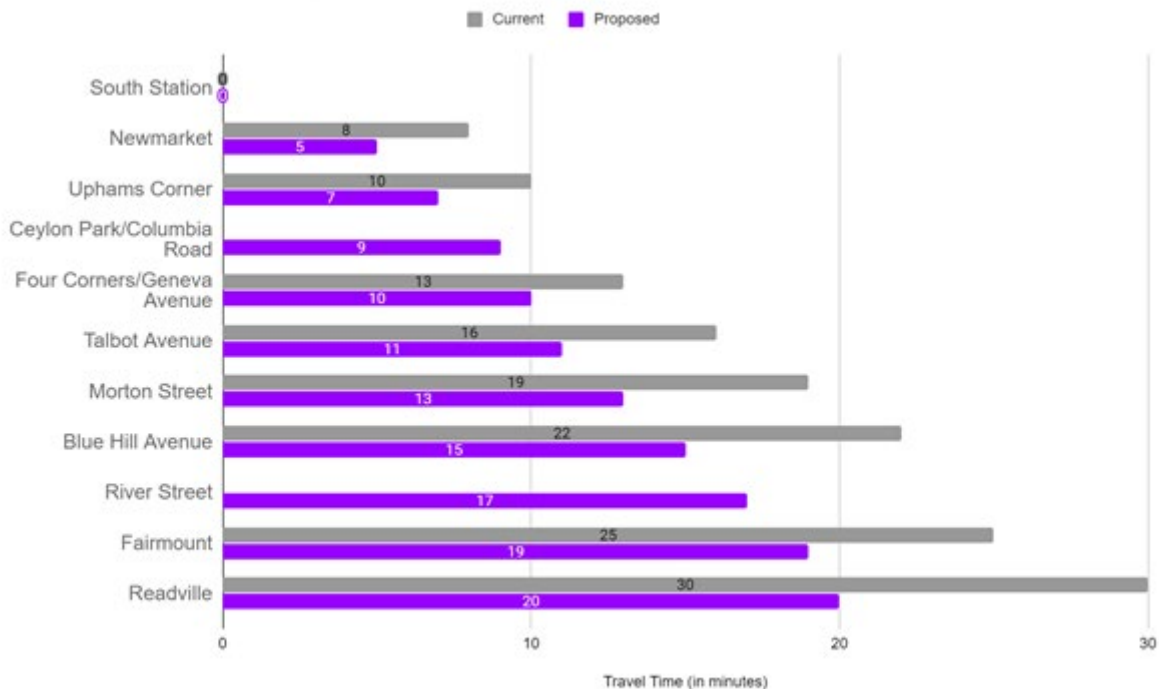
Speed

Right now, diesel trains take half an hour to travel between Readville and South Station. Even the most frequent locomotive hauled trains would be slow compared to EMUs. EMUs have better performance than diesel locomotives, for three reasons:

1. Electric power supplied by overhead wires can deliver more power at the wheel than a diesel engine.
2. Diesel engines have a much lower mean distance between failures than electric motors, on trains as well as buses.
3. EMUs power all wheels at once and therefore have higher acceleration, just as an all-wheel-drive SUV has higher performance than a two-wheel-drive car.

The acceleration advantage of EMUs is noticeable on every railroad, but it is the most important on lines with closely-spaced stops, such as Fairmount. Subway lines have even tighter stop spacing and as a result, require the high acceleration of EMUs to maintain a sufficient average speed. On the Fairmount Line, EMUs could reach 60 mph between stops, and even 80 mph in the southern section of the line. The result is that future EMUs could do the same trip in about 18 minutes, greatly reducing trip time from Dorchester, Mattapan, and Hyde Park to Boston.

FIGURE 9: CURRENT VS PROPOSED TRAVEL TIMES TO SOUTH STATION ON THE FAIRMOUNT LINE



Fare Structure:

The fare equity decision implemented in late May 2020 provides a major improvement to access for riders in the Fairmount corridor. Free transfers are particularly critical for the Fairmount Line, for a number of reasons:

1. The line runs in an urban area in an ideal setting for bus transfers, with several riders likely to transfer from buses.
2. At the city center end, the line only serves South Station requiring further connections to buses, the Red Line, or other Regional Rail lines to reach job centers such as Back Bay, Kendall Square, and the Seaport.
3. The residents along the Fairmount Line have low average incomes compared to riders of other commuter rail lines, making them more sensitive to differences in fares between modes of transportation.

This has long been a goal of Fairmount Line improvements. The Nelson/Nygaard study suggested implementing an arrangement wherein conductors would distribute paper CharlieTickets to riders, allowing a transfer to subways or buses, with a fare union for subway rides.¹⁴ Now that there exist fare validators at the stations, conductors could be given CharlieCards to distribute to riders.



Image Credit: Keolis

Tens of thousands of jobs have been created in the Seaport District and nearby South Boston, and these are now accessible to Fairmount corridor residents more quickly and with none of the previously unreasonable double fares (for both Commuter Rail and subway/bus). The time savings are significant. For instance, a walk to Northern Avenue and Tide Street from South Station takes over a half hour, but the trip is only seven minutes on the Silver Line. Red Line access means for example, jobs in Kendall Square are reachable with a substantial time savings. Adding the Fairmount Line to the rapid transit network with free transfers means a long-pursued social justice goal has been met.

With the Fare Transformation in the future, fare integration and free transfers will become the norm across the Regional Rail system.

¹⁴ The Boston Foundation/Nelson/Nygaard <https://www.tbf.org/-/media/tbforg/files/reports/increasing-ridership-on-the-fairmount-line.pdf>

Improved Connectivity:

While better frequency and electrification alone will make the Fairmount Line far more useful, there is additional work that must be done to improve the line's reach. Most of these items are relatively low cost; others, such as infill stations, are more expensive, but can still be built cost effectively.

Station Access

As the Fairmount Line is improved with schedule changes, increased frequency, and eventually electrification, it is useful to embark on a plan of improved access to stations for people accessing the station by foot or mobility device. To the extent the line's ridership is more similar to a subway line than a commuter rail line, incremental improvements to pedestrian access will increase ridership. A 2017 MPO analysis looked at station access issues and opportunities, recommending improved bicycle access and infrastructure, particularly at Morton Street, Talbot Avenue, Newmarket, and Four Corners/ Geneva station. The Fairmount Greenway proposal, if implemented, will also substantially improve pedestrian and bicycle access, by broadening the "walk shed" of each station. Another intervention is designing station access points to have more trees, increasing walk shed by making the walk more tolerable.¹⁵

Incremental improvements to pedestrian access will increase ridership.

One concern is safety. It is important to increase rider comfort, particularly when waiting at night or early in the morning. Good lighting, particularly near bike racks and shelters, is crucial for improving safety. Good wayfinding signage also improves rider comfort as well as legibility.



Four Corners/ Geneva station access.

(Image by TransitMatters)



The proposed Greenway route.

(Image Credit: Emerald Network)

¹⁵ For more information on the impact of heat on livability and the role of increasing shade, see Julia Hong, "Boston Neighborhoods Impacted by Urban Heat." <https://storymaps.arcgis.com/stories/1548beb5360e48648a43a595239fe3c5>

Infill Stations

The Fairmount Line's average stop spacing is 1.15 miles, similar to the Orange Line south of Ruggles. Historically, there were additional stations in Hyde Park and Milton, one of which was at River Street. With electrification reducing the stop penalty, it may be desirable to reopen River Street station depending on demand. River Street would also provide an additional access point from the Fairmount Greenway.

Another promising infill candidate is at Columbia Road, near Ceylon Park in the Grove Hall neighborhood. While parts of the neighborhood are served by the Four Corners/Geneva station, a stop here would increase the area in walking distance to a station, and provide an additional connection to the #16 bus, and possibly the #19 bus could be made.

Bus Connections:

There are several busy buses that run in close proximity to the Fairmount Line.¹⁶ The southern end of the line closely parallels the Route 28 bus, the second busiest bus route in Boston; it is crowded at rush hour, despite averaging only 8 mph. Faster and more reliable Regional Rail service would connect passengers in Mattapan to Downtown Boston four times as quickly as via the 28 bus and the Orange Line. Other busy bus lines close by could see relief with better rail service; for example, the Route 23 bus shares the north-south service pattern and sees 730 boardings and 730 alightings on the part of the route close to the Four Corners/Geneva stop on the Fairmount Line. Taken together, these data suggest that improved Fairmount Line service could serve as a substitute for some riders of these heavily-used routes and thus reduce crowding, in addition to likely providing a faster and more comfortable commute.

FIGURE 10: MAP OF FAIRMOUNT LINE INFILL STATIONS

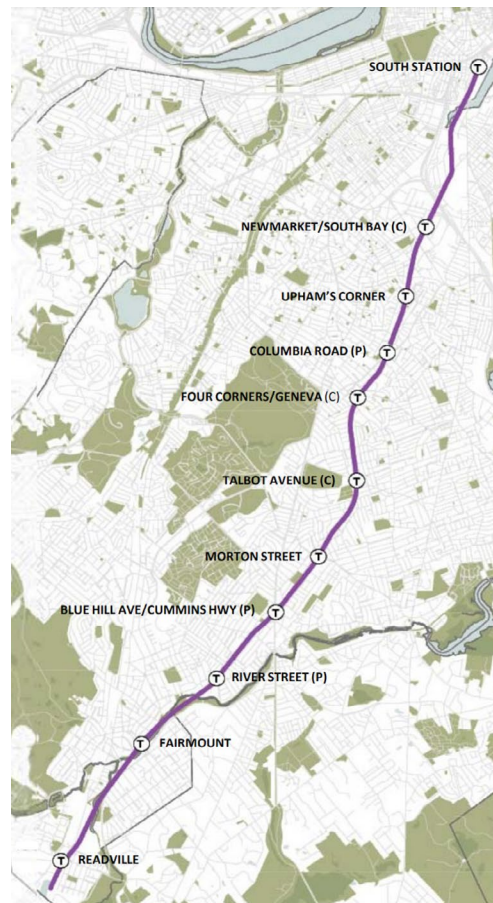


Image of proposed infill stops.

(Image Credit: Fairmount Indigo Planning Initiative, City of Boston/BPDA)

Faster and more frequent rail trips mean that service planning for buses should take into account the ability to serve new destinations. In fact, the MBTA is presently undertaking a bus network redesign. This process should consider the impact of frequent, electrified Fairmount Line service on bus demand, and realign routes accordingly. For instance, there may be a need for fewer routes to converge at Ruggles.

¹⁶ See pp. 11 and 35 of the Nelson/Nygaard/Boston Foundation report. <https://www.tbfg.org/-/media/tbfg/files/reports/increasing-ridership-on-the-fairmount-line.pdf>

Bus-Subway vs. Regional Rail Trip Times

FIGURE 11: MATTAPAN SQUARE TRIP TIMES

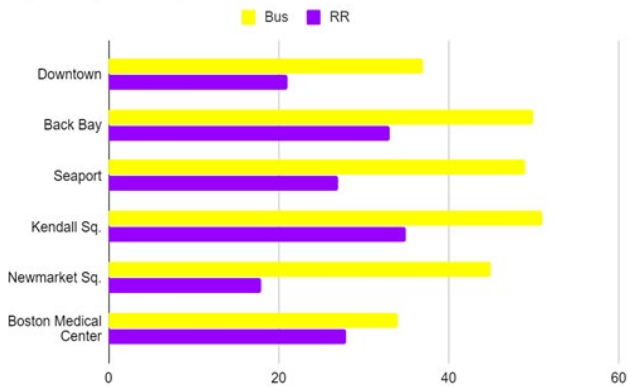
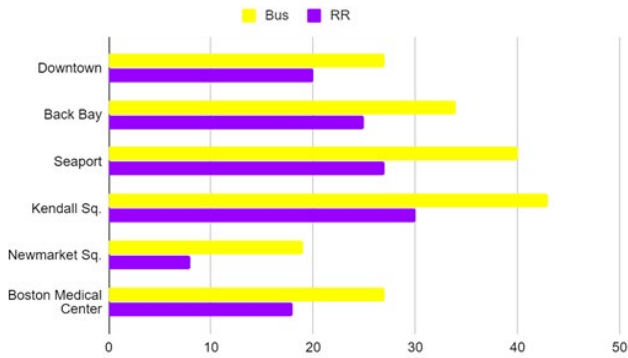


FIGURE 12: FOUR CORNERS/GENEVA TRIP TIMES



Existing Connections

FIGURE 13: EXISTING BUS CONNECTIONS

STATION	BUS CONNECTIONS
Newmarket	#8, #10, #CT3
Uphams Corner	#15, #41
Four Corners/Geneva	#19, #23
Talbot Avenue	#22
Morton Street	#21, #26
Blue Hill Avenue	#28, #29, #30, #31
Fairmount	#24
Readville	#32, #33

Franklin Line - Opportunities and Challenges

Historically, the Franklin Line and the Fairmount Line were built and operated as a single mainline. The Franklin Line reaches Downtown Boston today via the Northeast Corridor, but it remains an option to reroute it via the Fairmount Line instead. There are advantages and disadvantages to either route, but under no circumstances should trains alternate between the two routes (e.g. one train serving Fairmount and the other serving the Northeast Corridor), since that would serve each route at insufficient frequency and risk cascading delays.

The primary advantages are higher frequency on the Fairmount Line, and improved reliability from less branching on the Northeast Corridor trunk line; Franklin trains would have fewer conflicts. The primary disadvantages are that Franklin Line riders would lose their one-seat ride to Back Bay and Ruggles, and that the trip from Franklin would be five minutes longer than it would via the Northeast Corridor. However, there would be frequent transfer opportunities at both South Station and Readville, with trains to Back Bay and Ruggles serving Readville at least every 7.5 minutes

at full rollout; enhanced shelter over the walkways at Readville would improve the transfer there. Bus lanes on roads intersecting a Fairmount Line stop, such as Uphams Corner or Newmarket, could provide a better shuttle transfer to jobs in the Longwood Medical Area. The overall trade offs are explored below.

Prior to Franklin Line electrification, Franklin trains should continue to run via the Northeast Corridor: air pollution would be reduced, and the penalty of sharing a line with slow-accelerating diesels is lower on the inner NEC, where there are fewer intermediate stops. It may be possible to have a timed transfer at Readville between Fairmount and Franklin trains, in part to assess demand for Fairmount-Norwood trips. This would require scheduling Franklin Line trains to arrive at Readville within the window of time that Fairmount Line trains are ending one trip and beginning another. However, because diesel locomotives fail more frequently than EMUs, the schedule would be vulnerable to delays. If delays occur, then Fairmount trains should not be held at Readville beyond their scheduled turn window.

FIGURE 14: TRADE OFFS OF FAIRMOUNT SERVICE ROUTING

	Franklin via Fairmount	Franklin via SWC/NEC
Travel speed	Slower route: Readville-SS is 18 minutes, or 20 with additional infill	Faster route: Readville-SS is 15 minutes
Destinations near Central Business District (CBD)	None	Ruggles, Back Bay
Reverse-commuting	Opportunities for reverse-commuting from Dorchester and Mattapan to Dedham and Norwood	Only Hyde Park (near Fairmount station) would have frequent service to Dedham and Norwood job centers
Infrastructure needs	Slightly easier: Readville needs to be double-tracked to accommodate higher frequency in subsequent phases	Slightly harder: the junction needs to be grade-separated to reduce conflicts
North-South Rail Link service	More access from Fairmount to North Side	More service via the Back Bay portal than via the South Bay portal

Train Scheduling

Trains should run on a consistent schedule all day (between 5:00 AM and 1:00 AM), with equal frequencies in both directions. For maximum reliability and usefulness for passengers, these frequencies must be “clockface”. For instance, if a train arrives at Uphams Corner at :10 past the hour in a given direction on a four train-per-hour (tph) schedule, all subsequent trains in that direction must arrive there at :25, :40, :55, and :10, repeating. This not only makes for more reliable operations, it is more convenient and legible for riders.

Fairmount trains must use consistent captive tracks at South Station and shuttle back and forth. With electrification, trains can turn back within ten minutes to avoid congestion.¹⁷ With the eventual introduction of a North South Rail Link, dwell times at South Station would be greatly minimized, as Fairmount trains would travel to the north side of the MBTA system rather than terminating at South Station.

Frequency

FIGURE 15: PROPOSED FREQUENCIES WITH REGIONAL RAIL EMU SERVICE ON THE FAIRMOUNT LINE

Station Segment	Peak	Current	Off-Peak	Current
SOUTH STATION - READVILLE	7.5 MIN	~20 MIN	7.5 - 15 MIN	60 MIN

Note: Current frequencies shown on this chart are general averages of present frequencies.

Travel Time

Assuming level boarding, electrification, and EMU deployment, the proposed schedule below is feasible. Trains would run at least 60 mph between just beyond the South Station terminal area to Blue Hill Avenue. Between Blue Hill Avenue and Readville, trains could even run as fast as 80 mph. With the North-South Rail Link (NSRL), trains would run at 60 mph on the entire approach to South Station, as the speed constraints imposed by stub ending would be eliminated. This would save approximately one minute from the proposed schedule at right.

This sample schedule assumes no through-service with the Franklin Line, however it is possible to schedule around it. Removing the two proposed infill stations (in *italics*) reduces the proposed trip times by approximately two minutes.

FIGURE 16: PROPOSED TIMETABLE ON THE FAIRMOUNT LINE

FAIRMOUNT		
Station	Proposed	Current
SOUTH STATION	0:00	0:00
NEWMARKET	0:05	0:08
UPHAMS CORNER	0:07	0:10
<i>Ceylon Park/Columbia Road</i>	0:09	--
FOUR CORNERS/GENEVA	0:10	0:13
TALBOT AVENUE	0:11	0:16
MORTON STREET	0:13	0:19
BLUE HILL AVENUE	0:15	0:22
<i>River Street</i>	0:17	--
FAIRMOUNT	0:19	0:25
READVILLE	0:20	0:30

¹⁷ See the Regional Rail Proof of Concept Report (2019) for discussion of improving train turn times.

Fleet Requirement

The 20-minute timetable is designed to allow a train to complete a roundtrip within exactly an hour, including turnaround time at both terminals. Thus, 15-minute service requires four trainsets, 10-minute service would require six, and 7.5-minute service would require eight.

Capital Costs

In order to achieve full transformation of the Fairmount Line, the following investments are required. As stated above, initial service with 15-minute headways only requires four trainsets; the fleet costs below reflect 7.5 minute headways, and are based on European EMU costs.

FIGURE 17: CAPITAL COSTS OF FAIRMOUNT LINE PROJECTS

PROJECT	COST
8 route miles of electrification	\$45,000,000
High level platforms at Fairmount and Readville	\$40,000,000 (\$20,000,000 for each station)
Infill stations at Ceylon Park/Columbia Road and River Street	\$40,000,000 (\$20,000,000 for each station)
Eight 4-car EMU sets (four needed for first phase)	\$114,000,000
Grand Total	\$239,000,000

Literature Review

- » “Increasing Ridership on the Fairmount Line.” The Boston Foundation. <https://www.tbf.org/-/media/tbforg/files/reports/increasing-ridership-on-the-fairmount-line.pdf>

Nelson/Nygaard report for the Boston Foundation written in 2017 describes the improvements made on the Fairmount lines within the past decade while looking at further opportunities to increase ridership such as increased frequency and fare integration with buses and subways.

- » “Community Involvement in Commuter Rail Improvements: The Case of the Fairmount Line in Boston.” Andrew Lai, Massachusetts Institute of Technology. <https://dspace.mit.edu/bitstream/handle/1721.1/98939/922053628-MIT.pdf?sequence=1>

This doctoral thesis describes the activism that helped bring about new stations and improved service patterns along the Fairmount Line.

- » “Fairmount Corridor Plan.” Fairmount Indigo Planning Initiative. bostonplans.org/getattachment/653f6e4d-a482-4163-ad39-11876d8f656a

The Fairmount Corridor Plan, released in 2014, is a result of a community based planning process advocating for development and increased transit service along the Fairmount Corridor.

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:

- » While not critical to implementing a Regional Rail system, **the North-South Rail Link (NSRL)** between North and South Stations, allowing service between any two stations with either a direct trip or a single, seamless transfer, would be a highly useful enhancement providing the flexibility and connectivity to which many riders and potential riders would be drawn.

More information and reports available at:
<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



62 Summer St, Boston, MA 02110
transitmatters.org | [@transitmatters](https://twitter.com/transitmatters)