A BETTER CITY

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REIMAGINING REGIONAL MOBILITY

PRODUCTIVE, EQUITABLE, & DECARBONIZED REGIONAL MOBILITY

TRANSITMATTERS

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NOTE:

This report pulls from and builds off the April 2022 A Better City report, Keeping the MBTA on Track: Review of Prior Commitments, authored by Caitlin Allen-Connelly, Senior Advisor on Transportation, and Tom Ryan, Senior Policy Advisor on Policy, Government & Community Affairs.

A Better City represents a multi-sector group of nearly 130 business leaders united around a common goal: to enhance the Greater Boston region's economic health, competitiveness, equitable growth, sustainability, and quality of life for all communities. By amplifying the voice of the business community through collaboration and consensus-building, A Better City develops solutions and influences policy in three critical areas: 1. transportation and infrastructure, 2. land use and development, and 3. energy and the environment. A Better City is committed to building an equitable and inclusive future for the region that benefits and uplifts residents, workers, and businesses in Greater Boston.

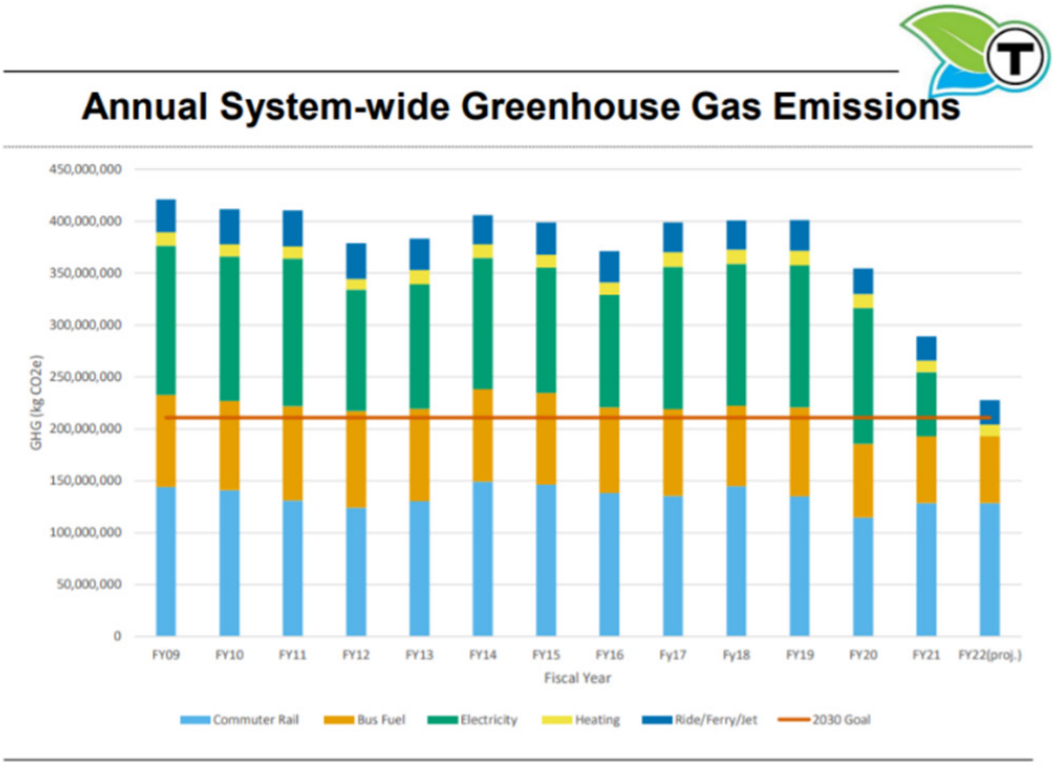
TransitMatters is dedicated to improving transit in and around Boston by offering new perspectives, uniting transit advocates, and informing the public. We utilize a high level of critical analysis to advocate for plans and policies that promote convenient, effective, and equitable transportation for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

EXECUTIVE SUMMARY

The MBTA ranks sixth in the nation for busiest Commuter Rail system, encompassing 388 miles across 14 rail lines, carrying over 125,000 passenger trips each weekday pre-pandemic. The system relies entirely on diesel locomotives to bring commuters into the city core via two main terminals—South and North Station—with peak headways between 20-50 minutes and off-peak headways between 40 minutes and one to two hours.[i]

Transportation accounts for approximately 40% of the state's greenhouse gas emissions (GHG). Commuter Rail, bus fuel, and electricity are responsible for the bulk of MBTA GHG emissions, followed by The Ride, Ferry, and heating.[ii] The scope and cost of decarbonizing the MBTA by 2050 is large, but the agency is in a unique position to reduce its own emissions by electrifying the Commuter Rail and bus fleet as well as reducing emissions more broadly via mode shift. [iii] These actions will require a strategic approach with investments that are properly sequenced and funded.

FIGURE I: Annual MBTA Greenhouse Gas Emissions



SOURCE: MBTA Environmental Department, Presentation to the MBTA Board of Directors, 1/20/2022

In 2018, with growing congestion in the region and pressure mounting for the state to reach net-zero by 2050, the Fiscal Management and Control Board (FMCB) called on the MBTA to "transform the current commuter rail line into a significantly more productive, equitable, and decarbonized enterprise." [iv] In November 2019, the Rail Vision team presented the FMCB with six alternatives to transform the Commuter Rail, ranging from higher frequency service with diesel locomotives and coaches (Alternative 1) to "full transformation" of the system entailing full electrification and 15-minute frequencies systemwide (Alternative 6) with the delivery of the final report in February 2020.[v] [vi]

The FMCB called on the MBTA to take immediate steps to implement Phase I of the three Phase Regional Rail process, which include steps to develop and launch an electric-multiple-units (EMU) Pilot on the Providence Line as well as EMU-operated service on the Fairmount and the Newburyport/Rockport Line through Lynn (covering Boston, Everett, Chelsea, Revere, and Lynn and referred to as the Environmental Justice corridor), and to establish a Commuter Rail Transformation Office with the sole purpose of advancing Rail Vision. On April 12, 2021, the Commuter Rail Transformation team gave a status report, outlining a deadline-driven approach to implement first steps for service and planning changes, Boston-Providence (EMU) Pilot, and Phase I electrification planning.[vii]

There have been significant implementation delays since April 2021, and the MBTA is considerably behind schedule. These setbacks will make it difficult for the MBTA to meet Phase I deadlines and to fully decarbonize the Commuter Rail system by 2050.[viii] To address the delays and advance transformation, in June 2022 the MBTA proposed a new approach to Regional Rail, which would rely entirely on discontinuous electrification—a system that combines overhead catenary and battery-electric multiple unit (BEMU) trains. The previous plan for Phase I planned for service on the Providence-Stoughton and Fairmount lines to run with overhead catenary and conventional EMUs.

While the use of BEMUs and discontinuous electrification are worth exploring further for future phases of Rail Transformation, the information the MBTA has provided thus far does not make a compelling case for shifting away from an overhead catenary-based approach for Phase I of Regional Rail. To meet the Commonwealth's decarbonization goals, the MBTA needs to offer Regional Rail service that provides better frequency and time savings, more reliable service, and meets the needs of the region's riders—benefits which conventional overhead electrification and EMUs are proven capable of delivering.

This report provides an update on the status of Rail Transformation and Regional Rail implementation and offers recommendations on next steps to advance Phase I. Further, it advocates for a transparent process going forward that results in faster, more frequent, reliable, and affordable service; as well as the adoption of an electrification approach that achieves these goals, decarbonizes the system, and best serves the future needs of the Commonwealth and surrounding region.

RECOMMENDATIONS

1. Advance and accelerate implementation of Phase I of Regional Rail, starting with an EMU Pilot on the Providence Line, if possible, by 2025, as well as electrification and EMU deployment on the Stoughton, Fairmount, and Newburyport/Rockport lines (through at least Beverly)

2. Include significant improvements to the Framingham/Worcester Line in Phase I to allow for service delivery improvements and, if possible, partial or full electrification to mitigate potential traffic disruption associated with I-90 Allston Multimodal Project

3. Adopt a fully transparent approach to Rail Transformation that rebuilds confidence and fosters an inclusive approach to decision making and public engagement, starting with the immediate release of all relevant information and associated documents related to Rail Transformation, including but not limited to:

- **A.** Power Study for a Discontinuous Approach
- **B.** Request for Information (RFI) associated with the BEMUs as well as the procurement process for the MBTA's consultants.
- **C.** Full analysis and comparison between BEMU and OCS
- **D.** Cost savings and cost effectiveness of BEMUs
- **E.** Costs (vehicles, facilities, maintenance, replacement, etc.) for BEMU approach
- **F.** Speed and acceleration capacity for BEMUs
- **G.** End-to-end travel time savings for BEMUs
- **H.** Identification of specific infrastructural and regulatory barriers to OCS electrification, including identification of specific challenge sites and alternatives assessment (e.g. technology to enable low catenary clearance under bridges)
- **I.** Other relevant technical information

4. Create a technical sub-committee to oversee implementation of Rail Transformation that includes members of the riding public (1 person), transportation advocates (2 persons), technical experts (1 person per issue area: technology, financing, project management/delivery), MBTA staff (2 persons), MassDOT staff (1 person), and Office of Energy and Environmental Affairs staff (1 person)

5. Develop a concrete timeline with benchmarks that is realistic and consistent with meeting the Commonwealth's decarbonization goals

MBTA COMMUTER RAIL TRANSFORMATION & MODERNIZATION

Modernization of the Commuter Rail system is an integral part of the MBTA's decarbonization strategy, and its success has a direct relationship to the Commonwealth's ability to induce mode shift, which accounts for up to 15% of the state-wide transportation sector emission reduction strategy.[ix] In November 2019, the FMCB voted to "transform the current commuter rail line into a significantly more productive, equitable and decarbonized enterprise…[that is] largely electrified…"[x] to be implemented in three phases, prioritizing transformation of the Providence/ Stoughton Line, the Fairmount Line, and Environmental Justice Line (Boston to Beverly).[xi]

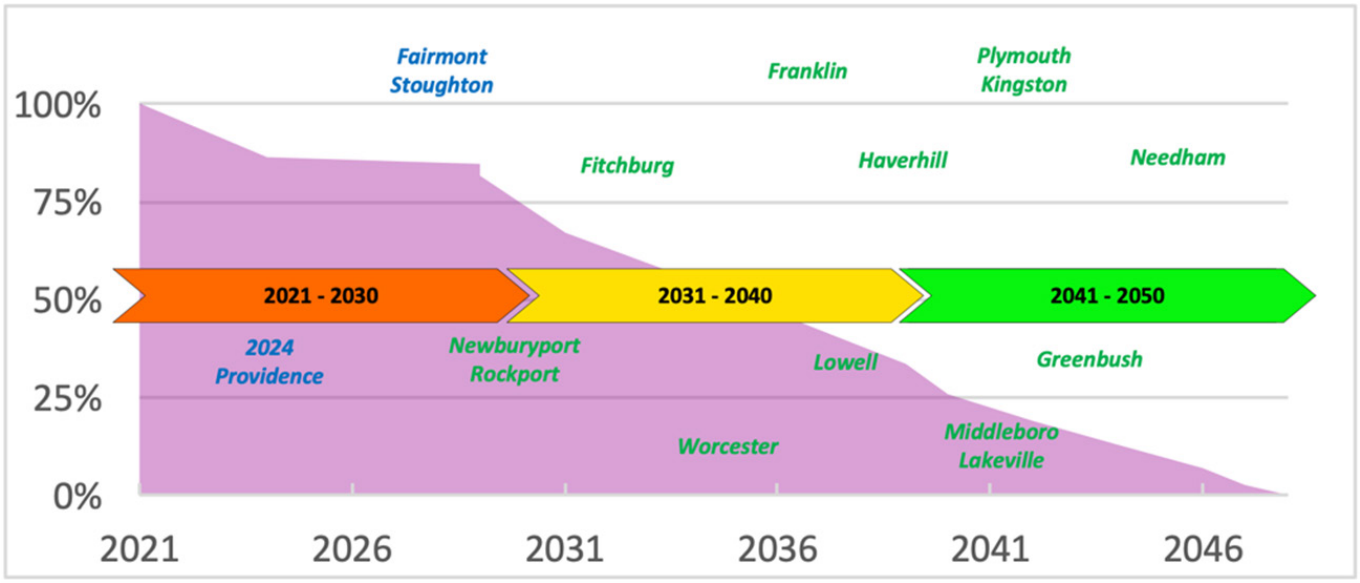
BOX 1: FMCB Vote on Commuter Rail Transformation

The FMCB directs the General Manager and his staff to **transform the current commuter rail line into a significantly more productive, equitable and decarbonized enterprise**. Specifically, the FMCB expects that the assets of **the commuter rail system of the future** will be more similar to **rapid transit providing all day service at intervals on its most dense corridors at 15-20 minute headways** and appropriately scheduled additional service on all of its lines (herein referred to as regional/urban rail). **The FMCB directs staff to develop a set of options that maximize the ridership returns on investment over the next ten years and support a pathway to more improvement over the long term, with particular emphasis on lines that are most likely to be well used. The FMCB expects that the system of the future will be largely electrified, be fully integrated in all aspects into the balance of the MBTA system and that last mile/first mile, increased parking access and other elements will be implemented as part of this program.** The FMCB expects the MBTA to develop a program of high-level platform implementation in a sequence that is consistent with the Program for Accessible Transportation Investment (PATI) and optimizes impacts for the customer.

SOURCE: FMCB (2019) Vote on MBTA Commuter Rail Transformation

The FMCB and called on the T establish a Commuter Rail Transformation Office to take immediate steps to implement Phase I of Regional Rail.[xii] In April 2021, the MBTA proposed a deadline driven timeline to get net zero by 2050 that would respond to the FMCB's vote and prioritize the Providence-/Stoughton, Fairmount, and Environmental Justice lines (Boston to Beverly), in Phase I (2021-2030), addressing important equity issues (access and environmental impact) on the commuter rail system. Phase 2 (2031-2040) and Phase 3 (2041-2050) would electrify the remaining lines (Figure 2).

FIGURE 2: MBTA Rail Phased Approach and Decarbonization Timeline



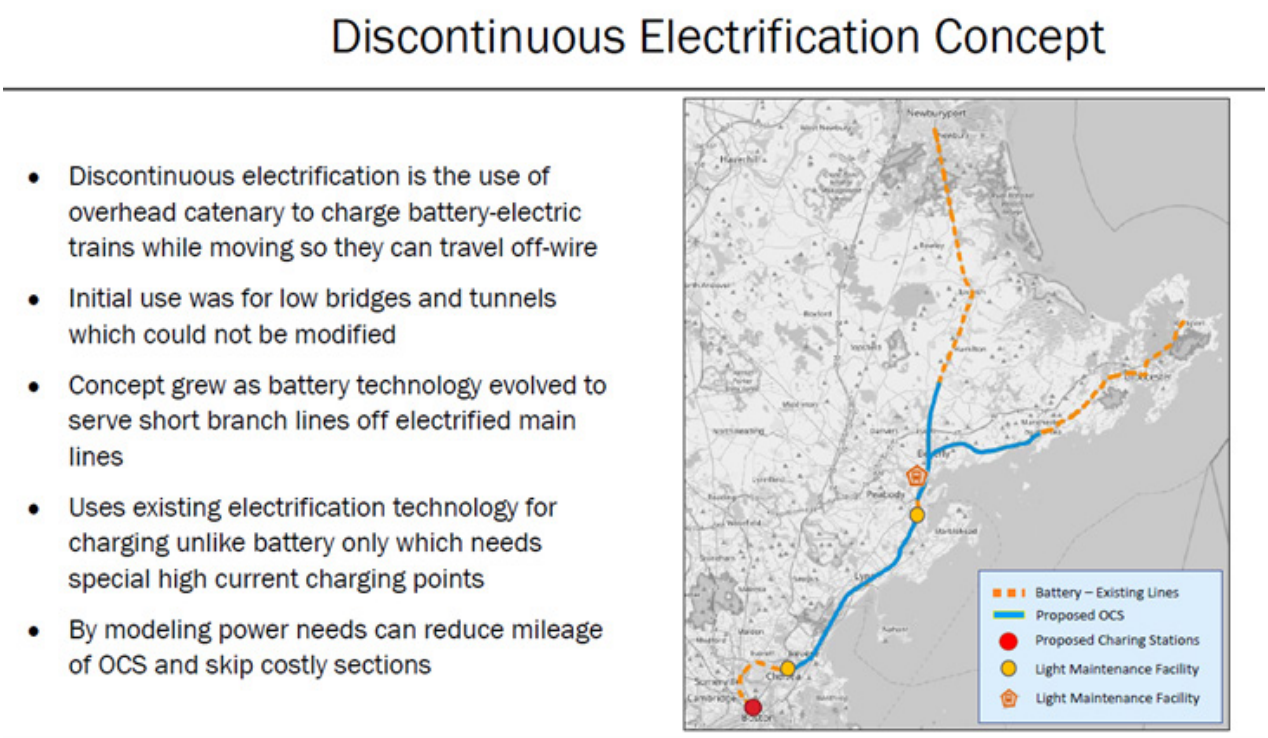
SOURCE: Regional Rail Transformation Update: EMU Pilot and Phase I Planning Update (April 12, 2021)
Note: Blue – Overhead Catenary; Green – Battery (with Overhead Contact System [OCS])

There have been significant implementation delays since April 2021, and the MBTA is considerably behind schedule. Without action, these setbacks could make it difficult for the MBTA to meet Phase I deadlines and to fully decarbonize the Commuter Rail system by 2050.[xiii] To move the transformation program forward, the MBTA is proposing a new approach to electrification—**discontinuous electrification**—which combines overhead catenary and battery-electric multiple unit (BEMU) trains (Figure 2).[xiv] The previous approach relied on overhead catenary with electric-multiple-units (EMUs).

MBTA SHIFTS COURSE TO DISCONTINUOUS ELECTRIFICATION APPROACH

On June 23, 2022, the Head of Rail Transformation gave the MBTA Board of Directors an update, presenting the proposed discontinuous electrification approach .[xv] The approach addresses some of the electrification challenges the Commuter Rail system faces: 1) lengthy environmental process; 2) power grid issues in remote areas; 3) slow and expensive catenary installation (tunnels/draw bridges); and significant vertical clearance issues, especially in downtown Boston under buildings.[xvi] However, the technology is not mature and not in use in revenue passenger service in North America, though some agencies are exploring their use at limited scale.[xvii] Moreover, where BEMUs are deployed, they are not used for the frequent service envisioned by the 2019 FMCB resolution, nor are there plans to use them for this purpose elsewhere. Further safety regulations for this type of vehicle are also forthcoming.[xviii]

FIGURE 3: MBTA Discontinuous Electrification Concept



SOURCE: MBTA Rail Transformation Presentation to the MBTA Board of Directors, June 23, 2022

According to the MBTA, a BEMU/OCS mix approach or a BEMU-only approach could reduce construction times to meet the State's net zero 2050 target (Figure 3). More information is needed from the MBTA to fully understand the pros and cons of pursuing this approach for the Commonwealth. For example, the MBTA should make public the Discontinuous Electrification Power Study, including assumptions on timing and regulatory issues for the OCS approach, Request for Information (RFI) associated with the BEMUs, speed and acceleration capacity, other technical information, costs (vehicles, facilities, maintenance, etc.), and end-to-end travel time savings.

PRELIMINARY CONCERNS WITH DISCONTINUOUS ELECTRIFICATION APPROACH

A Better City and other transportation advocates have significant concerns about the adoption of a BEMU only or BEMU-OCS approach, including the maturity of the technology and its ability to deliver the frequencies and end-to-end time savings envisioned for the region. While rail electrification does deliver some decarbonization benefits on its own, it is ultimately secondary to the mode shift benefits delivered by best practice electrification. Doing so would enable the delivery of service at least every 15 minutes on key corridors.

I. CAPABILITY AND EXPENSE OF TECHNOLOGY: While the MBTA believes that BEMUs will limit major capital expenses such as bridge raising, BEMUs are expensive and are an immature technology. While it is true that BEMU ranges and speeds have improved and an increasing number of operators are deploying BEMUs, they are only doing so on low-traffic, low frequency lines, contrary to claims made by the Baker administration during the transportation financing process in Summer 2022. We are not aware of any lines where BEMUs operate or plan to operate more than 2 trains per hour per direction.[xix]

At present there are no systems in North America that use BEMUs for revenue passenger service. Metra, the commuter rail operator serving Metro Chicago, is piloting the development of battery electric locomotives, but not for use at a Regional Rail level of frequency.[xxxxi] Further, the safety regulations for BEMUs use are still under development. None of the 16 peer agencies reviewed in 2019 as part of the Rail Vision process used BEMUs: 10 had transitioned to all electric service with the 4 providing a mix of service (diesel and electric), and 2 using diesel only (Table 1). MTA canceled a pilot to test the technology.[xxii] [xxiii]

TABLE I: Comparative Analysis - Fleet Power - Peer Agencies

Key Reporting Statistics from the Desktop Review of Peer Systems[1,2]

City/Region Served	Population within 1 Mile of Stations	Urban Area Size (Sq. Miles)	Transit Mode Share	No. Routes	No. Route Miles	Fleet Power Source*	No. of Vehicles in Fleet	Peak Frequency	Off-Peak Frequency**	Operating Expenses/ Passenger Trip***	Farebox Recovery	No. of Central Terminals
Boston	1,716,012	1,873	13%	14	388	Diesel	480	20	60	$ 11.93	49%	2
1 NYC - MNR	2,527,227	3,450	31%	5	273	Electric	1,206	5	20	$ 13.43	60%	1
2 NYC - LIRR	2,766,043	3,450	31%	11	319	Electric	1,185	10	30	$ 12.69	55%	1
3 NYC - NJ Transit	3,292,830	3,450	31%	12	501	Both	1,350	15	30	$ 11.25	57%	2
4 Philadelphia	5,441,567	1,981	9%	13	224	Electric	404	15	30	$ 7.40	57%	3
5 Chicago	2,946,626	2,443	12%	11	488	Both	1,188	20	90	$ 10.00	47%	4
6 Los Angeles	1,060,244	1,736	5%	7	412	Diesel	258	30	120	$ 15.85	39%	1
7 SF Bay Area	687,870	524	17%	1	77	Diesel	134	20	45	$ 6.11	79%	2
8 Toronto	1,618,941	243	23%	7	341	Both	725	15	30	$ 8.80	62%	1
9 Barcelona	Uncertain	160	20%	9	290	Electric	Uncertain	10	30	$ 3.61	57%	3
10 Paris	6,831,468	933	20%	13	900	Electric	1,182	5	5	$ 8.03	38%	0
11 London	3,429,647	606	44%	9	103	Electric	425	7.5	10	$ 2.18	78%	2
12 Manchester	2,022,004	211	14%	10	189	Both	1,062	15	15	$ 8.86	61%	3
13 Berlin	2,881,970	476	39%	15	203	Electric	650	10	15	$ 1.75	71%	3
14 Melbourne	2,274,090	3,857	35%	8	298	Electric	866	10	20	$ 10.75	27%	5
15 Hamburg	1,004,032	292	18%	6	91	Electric	Uncertain	10	10	Uncertain	Uncertain	Uncertain
16 Singapore	5,085,891	278	Uncertain	8	131	Electric	Uncertain	2	5	Uncertain	101%	0

Notes:

* Use of the term "both" represents that the agency operates both diesel-powered trains and electric-powered trains.

** Off-peak frequency varies by system and by line. What is represented in this table is the best off-peak frequency operated for all systems.

*** Operating expenses for international systems should be viewed with caution because they are not reported in a reliable manner and were converted into US dollars.

SOURCE: MBTA Rail Vision – Final Report (February 2020)

The principal issue is that the cost per train is higher for BEMUs. A line in Germany deploying BEMUs will use trains that cost about $4.8 million per American-length cars, with a procurement cost about double that of the conventional EMU equivalent,[xxiv] over a distance of about 75 miles.[xxv] In these cases, because demand is such that half-hourly or less frequent service suffices, the tradeoff of buying more expensive trains for less spending on infrastructure is worth it. But the more frequent and service is, the more trains must be run, meaning BEMUs don't scale well with even 15-minute frequency, much less the 7–10-minute frequencies warranted for many of the urban corridors that commuter rail serves.

For this reason, jurisdictions where rail ridership is high are not planning for BEMU adoption en masse. As TransitMatters noted in its Regional Rail electrification report, "It is telling that Norway, which is experimenting with battery technology and is the world leader in battery-electric car adoption, is nonetheless still wiring urban commuter lines with less peak traffic than Boston." Notably, Norway is electrifying the commuter rail system serving Trondheim, with trains about hourly, with overhead wire.[xxvi]

This makes the battery-only approach for the Fairmount Line as proposed by the Office of Rail Transformation particularly troubling. According to a corridor study by the Boston Foundation and Nelson/Nygaard, "The Fairmount Line serves some of Greater Boston's highest density residential neighborhoods. ... As of 2010, nearly 115,000 people live within a half mile of a Fairmount Line station."[xxvii] Further, some stations are as dense or close to the density levels of the catchment areas of the MBTA rapid transit stops with the highest density. Residents of the corridor also have some of the longest commutes out of all Boston residents.

Given these realities, 15-minute headways should be the minimum frequency for the line, and electrification needs to facilitate subway-like frequency here as well as along the inner Newburyport/Rockport and Framingham/Worcester lines in the near term – the former serves high density communities such as Lynn and Chelsea, which have long bus commutes to Boston, and employment centers which grew substantially in the 2010s, while the inner Framingham/Worcester line is dense and job-rich as well.

2. END-TO-END TIME SAVING BENEFITS: The MBTA needs to provide information regarding the assumptions it made in building timetables, particularly with respect to level boarding, track geometry, and schedule padding. Because BEMUs accelerate slower than conventional EMUs, it is likely that they will be less beneficial in terms of trip time savings than conventional EMUs would be. Analysis by TransitMatters shows an end-to-end trip time decrease of 29%-33% for Boston-Providence, 33% for Boston-Readville, and 43%-47% for Boston-Worcester, depending on the number of stations added.[xxviii]

3. PHASE I IMPLEMENTATION DELAYS: While the MBTA adopted the discontinuous electrification proposal in part to speed up Rail Transformation, the speculative nature of its assumptions make it unclear that adopting the new approach will reduce delays to Phase I implementation. More information is needed to determine the exact timing and appropriate method for delivering Phase I. At present, most of the "No-Regrets" projects are still in the planning and/or design phase, with only two in the construction phase (Annex I, Table 2). Further the FY23-27 CIP does not include any funding for vehicle procurement beyond a planning study, which may result in delays beyond Phase I.

LEVERAGING AND BLENDING OF FINANCIAL RESOURCES

In 2019, the FMCB voted advance Alternative 6, full Transformation of the MBTA Commuter Rail in phases, with an estimated price tag of $28.98 billon (2020$)/$40.7 billion (2030$).[xxix] The cost of Phase I was estimated to be approximately $1.5 billion, which included service changes and planning; a Boston-Providence EMU Pilot; and Phase I electrification planning. Estimates for implementation of Phase I by 2026 are thought to be higher at ~2.6 billion, which would include fleet costs, electrification, platforms, right-of-way expansion, tracks & signals.[xxx]

The MBTA should be leveraging and blending all potential financial resources to decarbonize the Commuter Rail, including (1) their own capital investment dollars, competitive grants available via the (2) Federal Bipartisan Infrastructure Law (BIL), (3) future MBTA Commuter Rail Service Procurement contracts, and (4) other public-private-partnerships.

FY23-27 AND FUTURE CIP

The five-year FY23-27 MBTA CIP allocates $65.1 million to Rail Transformation—a fraction of the funding required for Phase I—focused with many projects in the planning or design stage and does not include construction or procurement funding to advance projects.

FEDERAL BIPARTISAN INFRASTRUCTURE LAW (BIL)

There are unprecedented opportunities to apply for competitive grants to support regional rail and implementation of rail transformation. Figures in Annex I provides an overview of grants that are of high and medium relevance to this important initiative.

COMMUTER RAIL PROCUREMENT 2026

The MBTA currently outsources mechanical, transport, and engineering services for the Commuter Rail. Keolis was awarded an eight-year contract in July 2014, which was set to expire at the end of June 2022, but it was extended for two-years. Re-procurement could happen as early as 2025, but mostly likely a new contract will be awarded in January 2026. The MBTA should consider how this next procurement could support advancement and financing of rail transformation. More information is needed from the MBTA on what, if anything, has been done to advance preparation of the re-procurement strategy and process, including issuance of an RFI or RFP.

PUBLIC-PRIVATE PARTNERSHIPS

As noted by the FMCB, "the level of investment and the complexity [to transform the Commuter Rail] will require consideration of new contract mechanisms and new labor practices. The Board request[ed] the Legislature to support the statutory authorization for a public-private partnership and reform proposals in Governor Baker's transportation bond bill proposal." They emphasized that "greater use of the talent and innovation in the private sector is critical and tools that provide the Authority with greater leverage over long term performance of the private sector is essential."[xxxi]

The MBTA/Mass DOT could pursue public-private partnerships (P3s) as one source of financing I-90 mitigation. The recent A Better City report, *Public-Private Partnerships for the Massachusetts Bay Transit Authority*, outlines how P3s can offer transit agencies an opportunity for more cost-effective delivery of capital projects and their transit services. Successfully implemented P3s offer a combination of greater cost and schedule certainty, lower lifetime costs, faster design, construction and startup of service, state-of-the-art technology, and reliable and consistent service quality for periods up to thirty years or longer. The two major federal credit support programs for transit P3s are TIFIA and RRIF, both of which MBTA has already used. Its $517 million Positive Train Control project has a TIFIA loan of $162 million and a RRIF loan of $220 million.[xxxii]

CONCLUSION

The Office of Rail Transformation has faced numerous challenges since its inception, including limited funding and staffing, and uncertainty amidst the COVID-19 pandemic. We applaud progress on Regional Rail despite those challenges and support funding and planning for the near-term investments proposed. Yet the discontinuous electrification approach as presented to the Board in June 2022 poses more questions than it answers and reflects the goal of electrification as an end in itself, rather than a means to the end of improving service delivery to incentivize mode shift. Furthermore, funding remains a concern, with insufficient support from the Legislature to date.

The 2020s are a critical moment for meeting the Commonwealth's decarbonization goals. Simultaneously, the shift in work schedules and travel patterns, and rapid increases in traffic congestion back to (or exceeding) pre-pandemic levels, make transforming the Commuter Rail into a frequent, affordable, and reliable transit mode even more urgent. The MBTA cannot afford to tie the already delayed implementation of Regional Rail Phase I to a speculative method if it cannot prove that it can cost-effectively and rapidly provide all the benefits of a true regional rail system.

This report recommends the following measures to advance Phase I of Regional Rail, improve transparency and public engagement, create a sub-committee to ameliorate the planning, financing, and project delivery of Rail Transformation, and commit to a deadline that meets the Commonwealth's decarbonization goals and region's public transit needs.

RECOMMENDATIONS

1. Advance and accelerate, if possible, implementation of Phase I of Regional Rail, developing and launching an EMU Pilot on the Providence Line by 2025 as well as electrification of and EMU deployment on the Stoughton, Fairmount, and the Newburyport/Rockport lines through at least Beverly

2. Include significant improvements to the Framingham/Worcester Line in Phase I, if possible, to allow for service delivery improvements and electrification (partial and full) to mitigate potential traffic disruption associated with I-90 Allston Multimodal Project (Q3 2025)

3. Adopt a fully transparent approach to Rail Transformation that rebuilds confidence and fosters an inclusive approach to decision making and public engagement, starting with the immediate release of all relevant information and associated documents related to Rail Transformation, including but not limited to:

- **A.** Power Study for a Discontinuous Approach
- **B.** Request for Information (RFI) associated with the BEMUs
- **C.** Full analysis and comparison between BEMU and OCS
- **D.** Cost savings and cost effectiveness of BEMUs
- **E.** Costs (vehicles, facilities, maintenance, replacement, etc.) for BEMU approach
- **F.** Speed and acceleration capacity for BEMUs
- **G.** End-to-end travel time savings for BEMUs
- **H.** Specific barriers to OCS electrification, including identification of specific challenge sites
- **I.** Other relevant technical information

4. Create a technical sub-committee to oversee implementation of Rail Transformation that includes members of the riding public (1 person), transportation advocates (2 persons), technical experts (1 person per issue area: technology, financing, project management/delivery), MBTA staff (2 persons), MassDOT staff (1 person), and Office of Energy and Environmental Affairs staff (1 person)

5. Develop a concrete timeline with benchmarks that is consistent with meeting the Commonwealth's decarbonization goals

ANNEX I: STATUS OF NO-REGRETS PROJECTS & FEDERAL FUNDING OPPORTUNITIES

TABLE 2: Status of MBTA Rail Transformation No-Regrets Projects

NO REGRETS PROJECT	DESCRIPTION	STAGE	COST ($) FUNDED
RAIL TRANSFORMATION – EARLY ACTION ITEMS (P0940)	• 30min Brandeis/I-95 Urban Service (Fitchburg Line) • 30min Reading Highlands Urban Service (Haverhill Line) • Beverly Urban Service Resiliency (Environmental Justice Corridor)	Planning	$9.5M ($10M total authorized budget)
FUTURE ROLLING STOCK FLEET (P0918)	Planning future procurement of electrified or multi-mode Commuter Rail rolling stock • RFI Process 6 months • Decision to procure late FY2023 • Develop Request for Proposals & performance requirements 6-9 months • Planning/feasibility for electrified service Boston-Providence	Planning	$49.9M ($50M total authorized budget)
RAIL TRANSFORMATION PLANNING STUDIES (P0934)	• Planning re-procurement Service Planning – Fairmount Line Frequency Improvement	Planning	$5.5M ($13M total authorized budget with $7.5M spent on Technology Study – Completed in 2022; and $4.5M on Strategic Planning & Rail Vision – Completed 2019)
FRANKLIN LINE DOUBLE TRACK PHASE 3 (P0214)	• Extension of double track segments between Franklin and Norwood Central stations to create a continuous second track along the majority of the Franklin Line.	Construction	$28.3M FY23-27 CIP (total authorized $67.8M)
SOUTH SIDE HEAVY MAINTENANCE FACILITY (HMF) DESIGN	• Design and construction of a new heavy maintenance facility on South Side of Commuter Rail system to: 1) Overcome operational challenges that plague the repair and maintenance of the South Side fleet. 2) Expand maintenance capacity and improve system resiliency; 3) Offer flexibility to adapt facility to service possible future electrified fleet	Planning	Est. Cost = $400+M, Federal Investment Request = $245M

NO REGRETS PROJECT	DESCRIPTION	STAGE	COST ($) FUNDED
WORCESTER TRIPLE TRACK DESIGN (P0261)	• New third track and realignment of existing tracks on the Framingham and Worcester Commuter Rail lines between Weston and Framingham. Includes upgrades to Wellesley Farms, Wellesley Hills, Wellesley Square, and West Natick Stations.	Design	$31.5M FY23-27 CIP (total authorized $43.5M)
STATION PROJECTS	**DESCRIPTION**	**STAGE**	**COST ($) FUNDED**
	Lynn Station Improvements (R0071) *Design funding for new elevators, stairs, platform, canopy, and architectural improvements to the station and the intent to acquire and demolish structures under station's viaduct*	Design	$14.8M ($16.5M)
	Ruggles (P0175) *Addition of a new 800-foot-long commuter rail platform to service Track 2 at Ruggles Station and replacement of existing elevators for ease of access. Includes interior and exterior repairs and improvements to station facilities*	Construction	$2.5M $38.9M
	South Attleboro (P0178) *Design for the construction of a new South Attleboro Station to include 800-foot high-level platforms, 3 elevators, platform access ramps, a bus bay, egress to Newport Avenue, additional parking, improved vehicular circulation, and updated lighting*	Design	$1.6M ($7.0M)
OVERNIGHT LAYOVER PLANNING & PROJECTS	**DESCRIPTION**	**STAGE**	**COST ($) FUNDED**
	Haverhill Layover (P0865)	Design	$4.2M ($5.2M)
	Readville "Southside" Layover (P0863)	Design	$6.9M ($9.4M)
	Future downtown layover		

SOURCE: Regional Rail Electrification Plans: Track Power Planning for Regional and Urban Rail Services, Alistair Sawers, Head of MBTA Rail Transformation, and Daniel Hill, Network Rail Consulting, Study PM, June 7, 2022.

The following grant opportunities could support the advancement of Regional Rail. This list provides an overview of BIL and competitive grants but does not represent of the full list of grant submissions by the MBTA or MassDOT. Figure 4 and Figure 5 provide a status update on MBTA grant submissions (as at 12/1/2022).

- Multimodal Project Discretionary Grant Program (INFRA, Mega, and Rural)
- Consolidated Rail Infrastructure & Safety Improvements (CRISI)
- Federal-State Partnership for Intercity Passenger Rail Grants
- Capital Investment Grants
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE)
- Restoration & Enhancement Grant Program

FIGURE 4: Annual Summary of MBTA Federal Grants (SFY2022)

MBTA Federal Grants | Annual Summary | SFY2022

Federal Discretionary Grant Wins

Grant Program	Project	Requested	Awarded
USDOT RAISE (Rebuilding American Infrastructure w/Sustainability and Equity) FFY21	Blue Hill Ave. Transit Priority Corridor (City of Boston application)	$25.0 M	$15.0 M
FTA Passenger Ferry Program FFY21	Catamaran Overhauls (P0633)	$3.9 M	$3.9 M
FTA Bus & Bus Facilities Program FFY21	Quincy Bus Maintenance Facility (P0671a)	$22.0 M	$5.0 M
FTA Route Planning Restoration Program	Chelsea/Everett Cross-Town Routes Study	$1.0 M	$0.78 M
FRA Consolidated Rail Infrastructure and Safety Improvements (CRISI) FFY21	MBTA Suicide Trespass Prevention Project	$0.1 M	$0.1 M
USDOT RAISE (Rebuilding American Infrastructure w/Sustainability and Equity) FFY22	Lynnway Multimodal Corridor Project	$20.25 M	$20.25 M
FTA Low or No Emissions Program ("Low-No") FFY22	Procurement of 40ft Battery Electric Buses and Related Infrastructure (P0653)	*in procurement*	$116 M
DHS/ FEMA Transit Security Grant Program (TSGP) FFY22	Camera upgrades; cyber network; high-vis. anti-terror station & K9 patrols; training	$10.6 M	$6.9 M
FRA Federal-State Partnership for State of Good Repair (FRA SGR) FFY21	South Elm Street Bridge Replacement (P1115) (NNEPRA and MassDOT are joint applicants)	$7.6 M	$7.6M

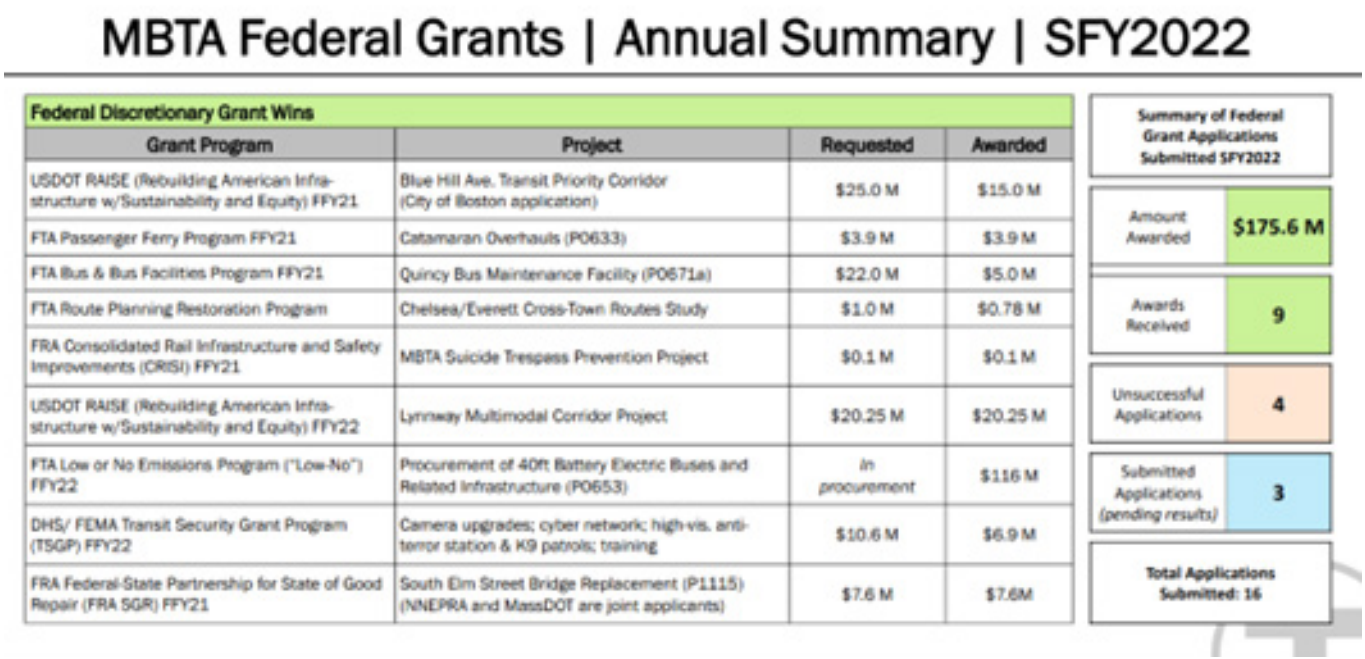
Summary of Federal Grant Applications Submitted SFY2022

Amount Awarded	$175.6 M
Awards Received	9
Unsuccessful Applications	4
Submitted Applications *(pending results)*	3

Total Applications Submitted: 16

SOURCE: Presentation to MBTA Subcommittee on Audit and Finance, 12/1/2022, Introduction to the FY24-28 Capital Investment Plan and FY22 Federal Grant Recap, page 15

FIGURE 5: Annual Summary of MBTA Federal Grants (SFY2022)



MBTA Federal Grants | Annual Summary | SFY2022

Federal Discretionary Grant Wins

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REFERENCES

i Ibid
ii MBTA Environmental Department, Presentation to the MBTA Board of Directors, 1/20/2022
iii https://www.mbta.com/sustainability/greening-the-fleet-decarbonizing-the-mbta
iv https://cdn.mbta.com/sites/default/files/2019-11/2019-11-04-fmcb-rail-vision-final-vote-accessible.pdf
v https://cdn.mbta.com/sites/default/files/2019-11/2019-11-04-fmcb-H-rail-vision-plan.pdf
vi https://cdn.mbta.com/sites/default/files/2021-07/2020-02-rail-vision-report.pdf
vii https://cdn.mbta.com/sites/default/files/2021-04/2021-04-12-fmcb-J-regional-rail-update.pdf
viii Phasing and decarbonization map, pg. 16, https://cdn.mbta.com/sites/default/files/2021-04/2021-04-12-fmcb-J-regional-rail-update.pdf
ix https://www.mass.gov/doc/ma-decarbonization-roadmap-lower-resolution/downloa
x https://cdn.mbta.com/sites/default/files/2019-11/2019-11-04-fmcb-rail-vision-final-vote-accessible.pdf
xi Note: The original resolution called for electrification to Lynn and did not include the Stoughton branch, but later analysis by Rail Transformation concluded that extension to Beverly was prudent and has included electrified rail service to Stoughton.
xii https://cdn.mbta.com/sites/default/files/2019-11/2019-11-04-fmcb-H-rail-vision-plan.pdf
xiii Phasing and decarbonization map, pg. 16, https://cdn.mbta.com/sites/default/files/2021-04/2021-04-12-fmcb-J-regional-rail-update.pdf
xiv Source: MBTA Rail Transformation Presentation to the MBTA Board of Directors, June 23, 2022
xv Ibid
xvi Ibid
xvii Ibid
xviii Ibid
xix The most frequent example we are aware of where BEMUs are planned, in northern Germany, has gaps between trains of 25 minutes, then 35 minutes, then 25, repeating.
xx Metra plans to pilot the battery locomotives on the Rock Island line, which in total runs five trains per hour in the peak direction at peak, but not in a manner providing "clockface" high frequency that Regional Rail would provide, and the scope of the pilot is unknown. See: "Metra to create battery-powered locomotives," Metra, August 17, 2022. https://metra.com/newsroom/metra-create-battery-powered-locomotives; also https://schedules.metrarail.com/pdf/alternative/RI.pdf
xxi Ibid
xxii https://www.railjournal.com/fleet/long-island-rail-road-to-pilot-bemus/
xxiii https://new.mta.info/document/85021
xxiv The BEMU procurement included maintenance, but any such procurement by the MBTA would likely include this as well. See "Regional Rail Electrification: Costs, Challenges, and Benefits," TransitMatters, Fall 2021, p. 14, http://transitmatters.org/s/Regional-Rail-Electrification-Final.pdf ; Levy, Alon, "In Motion Charging is Not For Trains," Pedestrian Observations, July 3, 2022, https://pedestrianobservations.com/2022/07/13/in-motion-charging-is-not-for-trains/ "Alstom signs contract for battery-electric regional trains in Germany," Alstom, February 5, 2020. https://www.alstom.com/press-releases-news/2020/2/alstom-signs-first-contract-battery-electric-regional-trains-germany
xxv By contrast, a roundtrip from South Station to Worcester Union Station is 88.4 miles.
xxvi TransitMatters, Fall 2021, p. 6 and p. 14.
xxvii https://www.tbf.org/~/media/TBFOrg/Files/Reports/Increasing%20Ridership%20on%20the%20Fairmount%20Line.pdf
xxix Ibid
xxx Figure 1, https://static1.squarespace.com/static/533b9a24e4b01d79d0ae4376/t/5ef3731c-ba31082f9c320924/1593013021884/TransitMatters+RR+Phase+1+200624.pdf
xxxi https://cdn.mbta.com/sites/default/files/2019-11/2019-11-04-fmcb-rail-vision-final-vote-accessible.pdf
xxxii A Better City (2022), Public-Private Partnerships for the MBTA (forthcoming)


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