



REPORT | APRIL 2022

# KEEPING THE MBTA ON TRACK:

## REVIEW OF PRIOR COMMITMENTS

# REPORT TEAM

## Written By:

Caitlin Allen-Connelly, Project Director  
Tom Ryan, Senior Policy Advisor on Policy,  
Government & Community Affairs

## Design Team:

Turner Skenderian, Marketing,  
Membership, & Communications Manager

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# NOTE:

The analysis relies on publicly available information from the MBTA, FMCB meetings, MBTA staff presentations, and other materials intended to inform the debate over priorities and investment plans.

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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.

# EXECUTIVE SUMMARY

The winter of 2015 was a tipping point for the Commonwealth’s public transit agency. After years of underinvestment, the Massachusetts Bay Transportation Authority (MBTA) faced a crisis—a state of fiscal and physical disrepair—and struggled to provide the region with safe, reliable public transit service. In response, in July 2015, Governor Baker created the [MBTA Fiscal and Management Control Board \(FMCB\)](#) to get the Authority back on track.

The FMCB set out to transform the MBTA into a 21<sup>st</sup> century transit system and met regularly with MBTA staff to improve the Authority’s capacity across ten strategic areas identified in the Board’s, [2017 Strategic Plan](#) (updated in [2018](#)): 1) safety; 2) customers; 3) infrastructure; 4) fiscal sustainability; 5) accessibility; 6) workforce; 7) management; 8) environment; 9) governance; and 10) capacity. These efforts produced measurable results, but much remained to be done when the Board’s term expired in July 2021.

Anticipating the need to ensure continuity and continuation of key initiatives, the FMCB established a number of blueprints, schedules, and requirements for MBTA staff to meet during the transition to a new Board. More importantly, they set in motion a culture change for the better, a legacy of transparency, and a variety of initiatives that if completed will produce a more effective, fair, environmentally sound, and financially accountable system.

A new MBTA Board of Directors was appointed by Governor Baker in October 2021 and assumed its duties at a critical time for the MBTA and the Greater Boston economy. Many workers will be commuting again to office buildings and business districts, but most likely in new commuting patterns based on more flexible work options. The safety, frequency, reliability, and cost of MBTA service are important factors that will influence how many commuters travel and the future economic growth of this region.

An MBTA system responsive to this critical moment can help address equitable recovery from the pandemic, the Commonwealth’s environmental and decarbonization goals, and chronic challenges of traffic congestion and auto dependence, particularly among those for whom owning and maintaining a personal vehicle represents a significant financial burden. The new MBTA Board does not need to start over or pull back from the plans developed in the last few years, they simply need to stay on track with the established plans.

This is the time to continue along the path created by the FMCB. The completion of the Green Line Extension, new Orange Line vehicles in service, and many buses traveling more efficiently through dedicated bus lanes throughout the region are all great and recent examples of the benefits riders are experiencing because of the FMCB’s work. They also show that the MBTA can deliver on multiple, complicated infrastructure projects that will bring positive benefits in the years ahead.

This report provides status updates on key FMCB initiatives and offers recommendations for making continued progress toward implementing some of the FMCB’s most consequential commitments. This analysis is designed to be a useful resource for the MBTA Board of Directors, T leadership, and city and regional stakeholders, with the goal of keeping the MBTA on track. If the current Board and staff take action to follow through on the work of the FMCB, the MBTA will be better positioned to serve the needs of current and future riders and to support equitable economic growth.

## STATUS UPDATE: KEY FMCB INITIATIVES

ISSUE	FMCB'S STRATEGY	CURRENT STATUS
<b>SAFETY</b>	Safety Review Panel Recommendations	
<b>RESILIENCY</b>	Climate Change Vulnerability Assessments & Projects	
<b>DECARBONIZATION</b>	Bus System & Commuter Rail Transformation <ul style="list-style-type: none"> <li>• Bus Facilities</li> <li>• Battery Electric Bus Procurement</li> <li>• Rail Vision Office</li> <li>• Rail Vision Early Action &amp; Phase 1</li> <li>• Rail Operator Contract Re-Procurement</li> </ul>	    
<b>EQUITY</b>	Means-Tested Fare Program	
<b>INFRASTRUCTURE</b>	Red Line/Orange Line Transformation Red-Blue Connector New Green Line Vehicles	  

### NOTE:

-  = Significant progress
-  = Moderate progress
-  = Limited progress/No progress

# SUMMARY OF RECOMMENDED NEXT STEPS

FMCB COMMITMENT	RECOMMENDED NEXT STEPS
<b>SAFETY</b>	<ul style="list-style-type: none"> <li>• Provide a public update on the anticipated next steps for all Safety Review Panel recommendations that are currently on hold.</li> <li>• Provide a cost estimate and expected timeline to fully implement Safety Review Panel recommendations and maintain a system that meets the Panel's safety levels and requirements.</li> <li>• Develop an externally facing dashboard to report on Safety Review Panel recommendations.</li> </ul>
<b>RESILIENCY</b>	<ul style="list-style-type: none"> <li>• Provide a comprehensive status update on each assessment.</li> <li>• Provide a detailed implementation plan for addressing and tracking the findings and recommendations (short-, medium-, and long-term) identified in the assessments.</li> <li>• Explain the CIP climate resiliency score process and impacts to date.</li> <li>• Provide a 10 year cash flow needs analysis to ensure adequate resources are available in a timely fashion.</li> <li>• Provide an update on how the MBTA plans to take advantage of BIL funding and competitive grants to risk assessment and capital projects to accelerate climate resiliency work.</li> </ul>
<b>DECARBONIZATION</b>	
<b>BUS TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Provide regular progress reports on:               <ul style="list-style-type: none"> <li>• Pending bus procurements, including EEH, Silver Line, BEB RFP and Technical Specifications, and future bus procurements; and</li> <li>• Bus facility modernization strategy timeline (planning, design, construction)</li> <li>• MBTA bus facility real estate strategy.</li> </ul> </li> <li>• Provide overview of MBTA preparation and plans for BIL to advance bus transformation.</li> </ul>
<b>COMMUTER RAIL TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Provide status report on Regional Rail Office staffing and recruitment.</li> <li>• Fund in CIP and provide regular status reports on implementation of early action items, planning studies, and EMU procurement for Providence EMU Pilot and well as electrification actions to advance Phase 1 (conceptual designs).</li> <li>• Provide an update on the status of the re-procurement strategy and preparation.</li> <li>• Provide an update on the preparation of the Regional Rail Business Case as well as an analysis and update of potential new funding resources for electrifying rail coming from the recently enacted BIL.</li> </ul>
<b>EQUITY</b>	
<b>MEANS-TESTED FARE PILOT</b>	<ul style="list-style-type: none"> <li>• Take immediate action to identify partner, funding source, and timeline for implementation of pilot.</li> <li>• Include in FY23 operations budget &amp; program and launch by September 1, 2022.</li> </ul>
<b>INFRASTRUCTURE</b>	
<b>RED LINE/ORANGE LINE TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Provide updated timeline for the existing Red Line/Orange Line Transformation Goals.</li> <li>• Provide updated timeline for receipt of all 252 new Red Line vehicles.</li> <li>• Provide updated timeline for receipt of all 152 new Orange Line vehicles.</li> <li>• Add funding into the CIP to support platform screen door infrastructure at multiple Red and Orange Line stations and signal upgrades to incorporate modest amounts of semi-automatic capability in routine train operations.</li> </ul>
<b>RED-BLUE CONNECTOR</b>	<ul style="list-style-type: none"> <li>• Award the contract for Preliminary Engineering &amp; Environmental Review.</li> <li>• Hold a Board Vote in 2022 to approve a Notice to Proceed. Include additional funding in the CIP to award a design/build contract by 2024.</li> </ul>
<b>NEW GREEN LINE VEHICLES</b>	<ul style="list-style-type: none"> <li>• Award the Notice to Process for the Type 10 Vehicles.</li> <li>• Update the public on the schedule for these vehicles.</li> </ul>

# SAFETY

## SAFETY REVIEW PANEL RECOMMENDATIONS

MODERATE PROGRESS: ●

In 2019, the MBTA ranked second nationally for train derailments—43 over a five-year period.<sup>1</sup> Two major derailments in the spring of 2019 on the Green and Red Lines prompted the FMCB to create the Safety Review Panel to investigate safety and safety culture at the MBTA. The panel, made up of three nationally recognized safety experts,<sup>2</sup> delivered a [report](#) in December 2019 with 34 recommendations and 61 corrective actions covering the four Federal Transit Administration (FTA) safety management system (SMS) components: safety policy, safety risk management, safety assurance, and safety promotion, as well as safety culture and financial review.

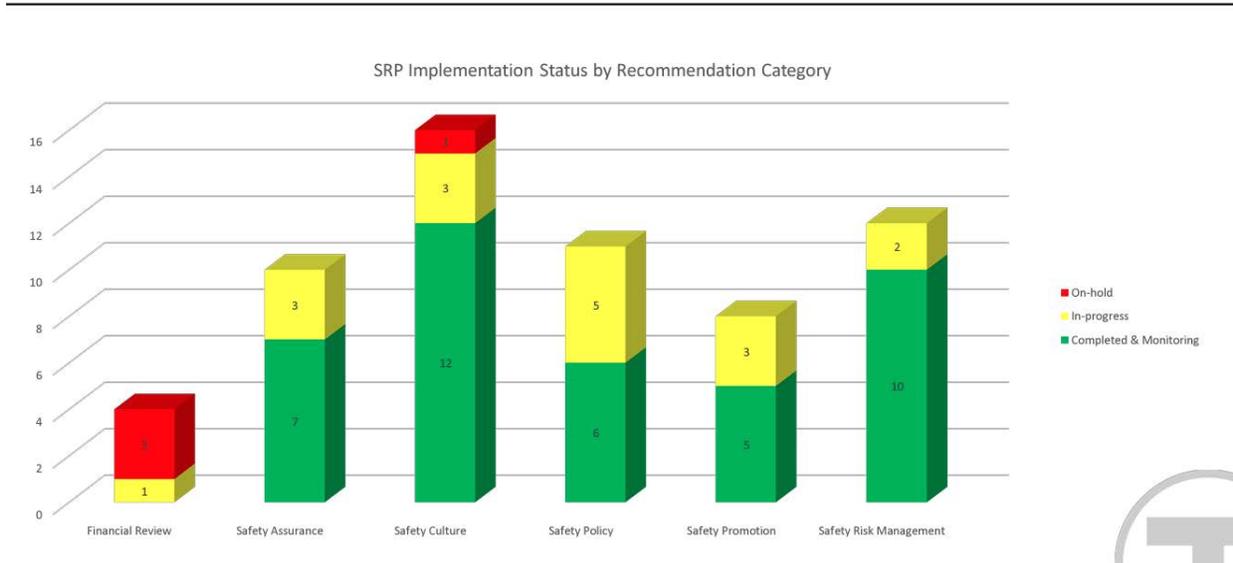
### Commitment under FMCB:

*Implement **Safety Review Panel Recommendations** as well as maintain and fund a system that meets the Panel's requirements and enables a positive safety culture throughout the Authority*

Since the release of this report, the MBTA has been monitoring its performance with implementation of these 34 recommendations. A year after the Panel's report was issued, the MBTA provided the FMCB with a [comprehensive overview](#) of measures taken to address the panel's recommendations. In February 2022—two years after the initial report was submitted—the MBTA presented another update showing 66% of recommendations complete, 28% in-progress, and 6% on hold (Figure 1). While this is encouraging, in some recommendation areas like Financial Review, three of the four recommendations represented in red are “on hold”—showing little to no progress.<sup>3</sup>

**FIGURE I:** Safety Review Panel Recommendation Implementation Status

## Implementation Status by Category



**SOURCE:** [Safety Review Panel Update, MBTA Presentation, February 24, 2022](#)

These unaddressed recommendations are:

- MBTA must perform a [zero based budget] analysis of each department to identify the appropriate level of resources needed to ensure the safe delivery of service and support core business functions.
- MBTA must avoid a top down approach to conducting the [zero based budget analysis] and have an inclusive dialogue with those directly impacted by these decisions.
- MBTA must re-examine the financial process to provide efficiencies and flexibility to address the needs of daily operations and the capital spending.
- Organize and encourage site visits in the first 100 days to help new hires gain a better understanding of how the T works together to achieve its mission.

With the number of recent safety incidents, it is critical that safety remain a top priority for the MBTA. Explaining the details and extent of financial costs to achieve a safety and reliable system is an essential component to understanding the scale of this challenge and how close the MBTA is to reaching full implementation of the Safety Review Panel recommendations. The MBTA should continue to provide monthly updates to the Board of Directors and consider developing a dashboard for internal and external use to report on safety recommendation implementation status looking to peer agencies such as Washington Metropolitan Area Transit Authority ([WMATA](#)), Metropolitan Transportation Authority ([MTA](#)), and others for examples.<sup>4</sup>

## **RECOMMENDED NEXT STEPS**

The Board should consider the following next steps:

1. Provide a public update on the next steps for all Safety Review Panel recommendations that are currently on hold.
2. Provide a cost estimate and expected timeline to fully implement Safety Review Panel recommendations and maintain a system that meets the Panel's safety levels and requirements.
3. Develop an externally facing dashboard to report on Safety Review Panel recommendations.

# RESILIENCY

## CLIMATE CHANGE VULNERABILITY ASSESSMENTS & PROJECTS

MODERATE PROGRESS: ●

Transforming the MBTA into a 21st century public transit system includes ensuring the system is climate-ready and -friendly. It must be resilient to the harsh and extreme weather patterns—stressors which threaten the system’s ability to deliver safe, reliable transit service—and reduce the system’s environmental impact, including carbon emissions and other greenhouse gases (GHGs), to help the Commonwealth achieve its ambitious integrated [climate change strategy](#) and [decarbonization goals](#). This means assessing vulnerability and identifying carbon reduction opportunities across the system, as well as developing tangible actions with concrete plans, and adequate capital to make the necessary changes.

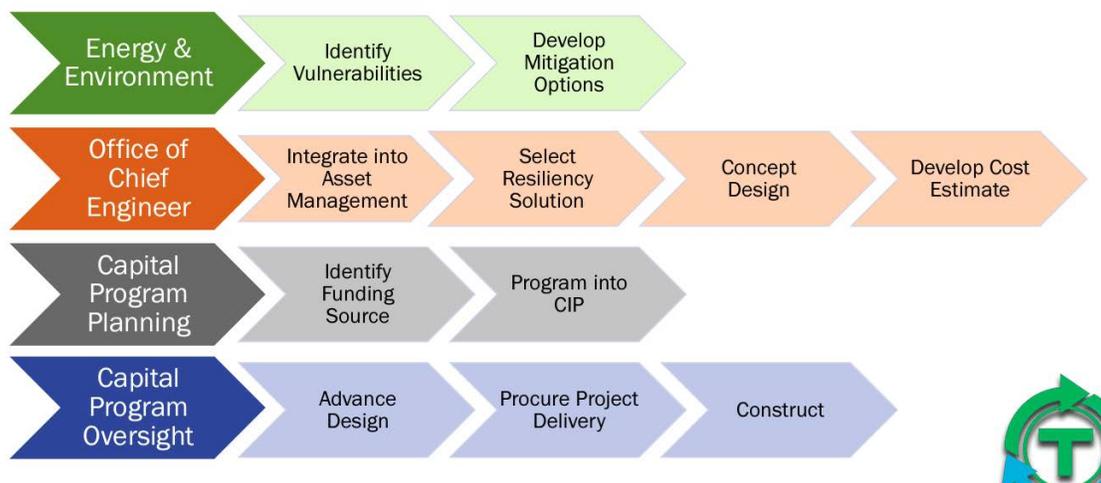
### Commitment under FMCB:

*Complete Both **Corridor and Systemwide Climate Change Vulnerability Assessments** and implement all steps identified in the **MBTA Climate Resiliency Project Development Process***

To this end, the [MBTA’s 2017 Strategic Plan](#) called on the MBTA to “prioritize environmental stewardship and climate resiliency” and complete systemwide assessments to determine the vulnerability of MBTA infrastructure and assets in the face of climate change.<sup>5</sup> The MBTA completed its [MBTA Vulnerability Assessment Report](#) in 2018, which provided a framework for assessing and scoring the system’s vulnerability to climate change. This report laid a foundation for further work by the MBTA to identify vulnerabilities and develop a process for addressing, including developing mitigation options, integrating into the [transit asset management](#) process, selecting resiliency solutions, designing concepts, estimating costs, and embedding resiliency into the Authority’s [Capital Program Planning \(CIP\)](#) and oversight processes (Figure 2).

**FIGURE 2:** Climate Resiliency Project Development Process

## Climate Resiliency Project Development Process



SOURCE: [MBTA Presentation to FMCB, December 7, 2020: MBTA Climate Resiliency](#)

The [Fall 2019 and Spring 2020 Strategic Planning Reports](#) emphasized the need for the MBTA to continue to take actions to improve the resilience of the system to climate change and related extreme weather events. In December 2020, the MBTA provided an overview of the Authority’s climate resilience program, including the T’s climate change resilience strategy, the process for implementing projects, and the status of climate vulnerability assessments.<sup>6</sup> The update showed positive steps forward, having completed one full vulnerability assessment (Blue Line) with some elements of other corridors (Green Line Extension) and system-wide assessments finished, but they proposed a schedule for upcoming assessments. Many of these efforts are now complete but have not been presented to the new Board of Directors in a public meeting (Table1).

**TABLE I:** Status of MBTA Vulnerability Assessments

ASSESSMENT TYPE	STATUS	NOTE
<b>CORRIDOR ASSESSMENTS</b>		
<b>BLUE LINE</b>	Complete	Does not appear to provide separate vulnerability scores for 2030 & 2070
<b>RED LINE</b>	Complete	
<b>ORANGE LINE</b>	Complete	
<b>SYSTEM-WIDE ASSESSMENT</b>		
<b>POWER, SIGNALS &amp; COMMUNICATION SYSTEMS</b>	Complete	
<b>PUMP ROOM DRAINAGE MAPPING</b>	Complete	Does not appear to provide separate vulnerability scores for 2030 and 2070. Assessment appears to be a current analysis of asset condition with findings that show 27 in poor condition, 18 in severe condition, with the remaining 6 in either fair or undefined condition.
<b>VEHICLE STORAGE</b>	June 2021	Pending
<b>FACILITY ASSESSMENTS</b>		
<b>MBTA BUS FACILITIES</b>	Complete	Does not appear to provide composite vulnerability scores
<b>EVERETT CAMPUS</b> (bus, rail, shops)	2022	
<b>CHARLESTOWN YARD</b> (post seawall condition)	May 2022	
<b>BUS FACILITY</b> (deeper dive Lynn, Albany, Arborway, Fellsway)	May 2022	
<b>COMMUTER RAIL SYSTEM</b>		
<b>INCLUSIVE MAINTENANCE FACILITIES, LAYOVERS, &amp; CORRIDORS</b>	Complete	Does not appear to provide composite vulnerability scores for 2030 or 2070 but rather categorizes by high, medium, low or minimally vulnerable facilities

**SOURCE:** Authors based on publicly available information on the [MBTA website](#) and [MBTA presentation to the FMCB on December 7, 2020](#)

Prioritizing an update on resiliency is vital during the development of the FY23 –27 five-year capital plan to ensure adequate funding is available to implement the necessary actions to safeguard the system in 2030, 2070, and beyond. It may also better position the MBTA to take advantage of the federal Bipartisan Infrastructure Law (BIL) PROTECT *Program, Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation*, formula funds, and competitive grants.

## RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

1. Provide a comprehensive status update on each assessment.
2. Provide a detailed implementation plan for addressing and tracking the findings and recommendations (short-, medium-, and long-term) identified in the assessments.
3. Explain the CIP climate resiliency score process and impacts to date.
4. Provide a 10 year cash flow needs analysis to ensure adequate resources are available in a timely fashion.
5. Provide an update on how the MBTA plans to take advantage of BIL funding and competitive grants to risk assessment and capital projects that accelerate climate resiliency work.



# DECARBONIZATION

The Commonwealth has ambitious decarbonization goals. Transportation accounts for approximately 40% of the state’s greenhouse gas emissions.<sup>7</sup> The scope and cost of decarbonizing the MBTA by 2050 is large, but the agency is in a unique position to both reduce its own emissions and impact emission reductions more broadly by increasing ridership through mode shift. Achieving this will require a strategic approach with investments that are properly sequenced and funded.

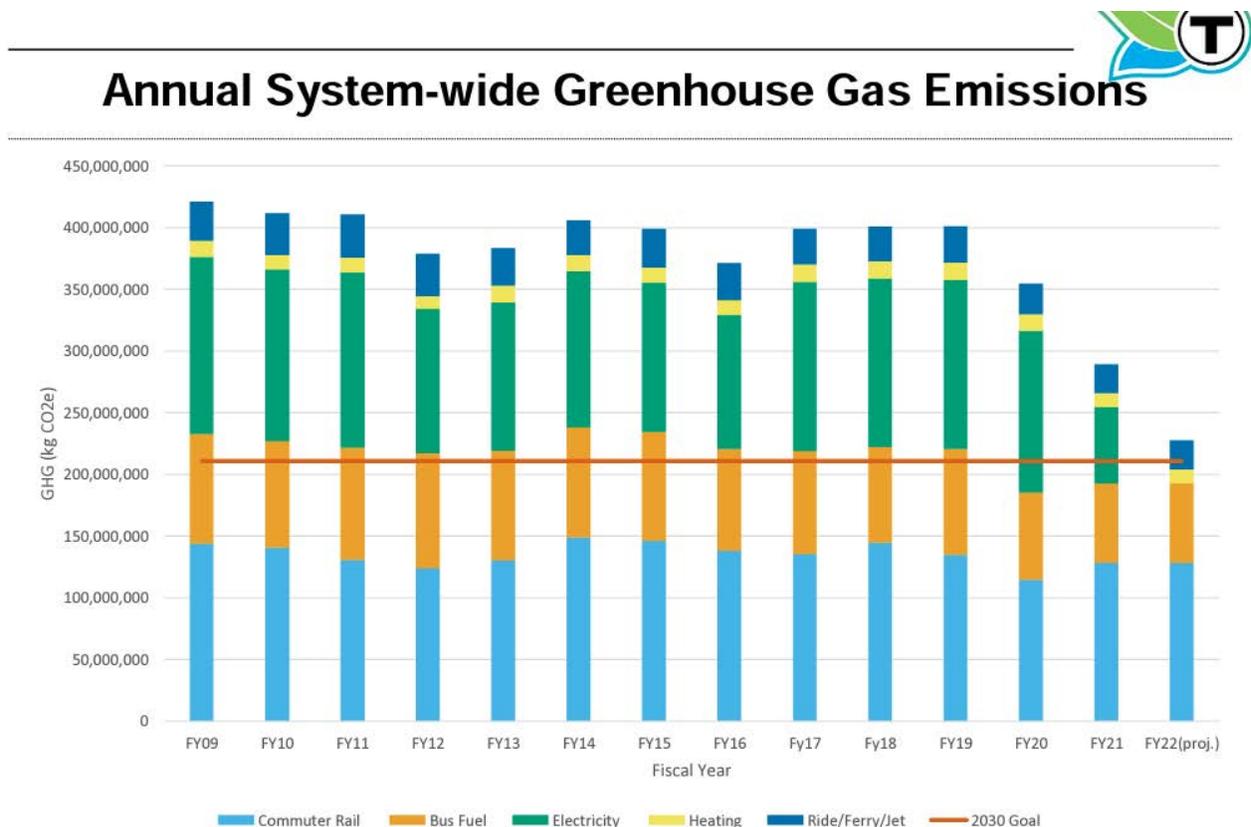
## Commitment under FMCB:

**Bus Transformation:** Deliver a new bus facility every 2-3 years and to purchase of 80-100 new Battery Electric Buses (BEB) or hybrid buses annually to replace buses at end of service life.

**Commuter Rail Transformation:** Transform the current commuter rail line into a significantly more productive, equitable, and decarbonized enterprise.”<sup>8,9</sup>

In FY21, Commuter Rail, bus, and electricity were responsible for the bulk of MBTA GHG emissions followed by The Ride, ferry, and heating (Figure 3).<sup>10</sup> The MBTA has made great strides to reduce energy-related emissions, most notably a commitment and agreements to purchase 100% of the Authority’s electricity from renewable energy sources. It is also investing in technology for smarter energy management and has made over 100 energy efficiency upgrades that reduce emissions and save money.<sup>11</sup> Further, the MBTA is taking action to electrify the MBTA bus fleet and Commuter Rail to reduce emissions from these top system polluters.<sup>12</sup>

**FIGURE 3:** Annual MBTA Greenhouse Gas Emissions



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

This section looks at the status of these two transformational programs (bus and Commuter Rail), which require significant capital investment for infrastructure and facility upgrades and retrofits, as well as revenue vehicle procurement. Further, they are time sensitive and tied to critical benchmarks in the Commonwealth’s decarbonization roadmap. With unprecedented federal resources available for infrastructure through BIL formula and competitive grants as well as other grant opportunities, the MBTA may be able to leverage this opportunity to advance these efforts over the next five years.<sup>13</sup>

## BUS TRANSFORMATION

### BUS FACILITY MODERNIZATION & BUS PROCUREMENT

**MODERATE PROGRESS:** ●

The MBTA Bus Transformation is critical component of the Authority’s decarbonization plan. The initiative has four primary objectives and relies on an integrated approach to fleet conversion and facility upgrades, with the pace of bus electrification depending on the pace of bus facility modernization.<sup>14</sup>

1. Convert the entire bus fleet to zero emissions technology.
2. Modernize all bus maintenance facilities to accommodate zero emissions technology.
3. Transition to a more uniform bus fleet replaced on a predictable, annual timetable to reduce capital, maintenance, and operations costs.
4. Increase fleet size to respond to growing ridership.

In 2021, the MBTA Bus Transformation team presented the FMCB with an ambitious timeline for the implementation of the program (Figure 4) to deliver a new bus facility every 2-3 years, requiring approximately \$4.5 billion in investments, and purchase 80-100 new Battery Electric Buses (BEB) or enhanced electric hybrid (EEH) buses annually (~\$100-\$130 million) to replace buses at end of service life.<sup>15</sup> Successful implementation of the strategy requires sustained annual programming of funds to advance all stages of the projects, including design, real estate, and construction, as well as bus procurement.<sup>16</sup> This plan was updated and presented to the new MBTA Board of Directors in March 2022, showing a transition to 100% BEB by 2040 with 2027 (30% BEB) and 2030 (more than 50% BEB) as important milestones, which is consistent with the 2021 plan.<sup>17</sup>

The MBTA is making incremental progress on facility modernization forward such as the recent ribbon cutting to kick start work at the Quincy bus facility.<sup>18</sup> Further, the Authority included funding to advance investments in the bus network as part of the One-time Investment Opportunities Plan that moved \$500 million from MBTA reserves.<sup>19</sup> This plan will support construction at the North Cambridge facility and provide design funds for the Arborway Facility—both locations were identified as priority projects for the future bus network. (*nb*: Unfortunately, during the renovations of the North Cambridge facility, the MBTA will not be able to use the existing all-electric buses that have served the Cambridge and Watertown area. This results in a step backwards in terms of carbon emissions, as diesel-hybrid buses will operate until the new bus facility is ready in two years.)

**FIGURE 4:** Bus Transformation Timeline

## Fleet and Facilities Timeline

Investment Type	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29
Facilities	Quincy Real Estate (FY21); Quincy Final Design (FY22)	Quincy Construction - \$305M, Included in FY22 CIP Preview			Quincy Opens				
		North Cambridge Final Design and Construction - \$23M, Unprogrammed		North Cambridge Opens					
		15% Design Arborway Programmed	Final Design Arborway- \$25-35M, Unprogrammed (needed FY22)		Construction Arborway- Approx. \$400M, Unprogrammed		Arborway Opens		
				Concept Design Facility #3 Programmed	Final Design Facility #3 - \$25-35M, Unprogrammed		Construction Facility #3 - Approx. \$400M Unprogrammed		
Fleet		Retire 32 DMA fleet, replace with 45 60-ft EEHs							
		310 Diesel buses retire (includes 86 buses at Quincy - requires new facility) Replace with 160 EEHs							
			ETB Trolleybuses retire Replace with 35 BEBs for N. Cambridge and 45 for Quincy						
						60 Ft Fleet retire (requires new facility) Replace with BEBs			
								CNG Fleet retire (requires new facility) Replace with BEBs,	
Purchase BEBs or EEHs, dependent on facilities									

**SOURCE:** [Presentation to FMCB, MBTA Bus Transformation Update Part 1: Fleet and Facility Update, April 26, 2021](#)

With respect to new orders for BEB or hybrid buses, the MBTA committed to continued fleet modernization and emission reductions by adding 80 to 100 new buses per year. They have parallel contracts in place with flexibility to adjust EEH/BEB ratio of procurements depending on facility modernization progress, specifically BEB charging capacity.<sup>20</sup> The MBTA Board of Directors voted on March 24, 2022, to proceed with procurement of 160 EEH buses as previously planned (Table 2). Further, the MBTA staff noted that a Request for Purchase (RFP 1F-22) and Technical Specification (VE-21-054) for the procurement of 400 BEBs would be released on April 22, 2022.<sup>21</sup>



**TABLE 2:** Overview of Programmed and Unprogrammed BEB and Hybrid Bus Procurement

TYPE	ESTIMATED COST PER VEHICLE	PROGRAMMED	UNPROGRAMMED
<b>ENHANCED ELECTRIC HYBRID CONTRACT</b>	<b>\$750K-\$850K</b>	Initial 160 base order delivery in 2022 & 2023	Options for up to 300 additional buses <i>(Bus procurement options total 80-100 annually &amp; will be split between the two available contracts)</i>
<b>BATTERY ELECTRIC BUS CONTRACT</b>	<b>\$850K-\$1.1M</b>	Initial 80 base order to be delivered in 2023 & 2024 (in FY23-FY27 CIP P0653) <i>(Delivery of first buses time for 2023 time to North Cambridge &amp; Quincy Facility opening)</i>	Options for up to 380 additional buses <i>(Bus procurement options total 80-100 annually &amp; will be split between the two available contracts)</i>

**SOURCE:** [MBTA Bus Transformation Update Part 1: Fleet and Facility Update](#)

The MBTA is making strides to advance the bus transformation program; however, much work and capital investment remains and is required to meet the fleet and facilities timeline by 2030-2040 as well as to complete the overall system plan. As the MBTA develops its five-year CIP funding for facility modernization and purchase of BEB or hybrid buses must be a high priority. The Authority should also lean in on its progress to position itself for BIL funding, which prioritize decarbonization of public transit bus fleets (Low-No-Emission-Program) and modernization of bus facilities (Bus and Bus Facilities).

## RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

1. Provide regular progress reports on:
  - Pending bus procurements, including EEH, Silverline, BEB RFP, and Technical Specifications, and future bus procurements; and
  - Bus facility modernization strategy timeline (planning, design, construction)
  - MBTA bus facility real estate strategy.
2. Provide overview of MBTA preparation and plans for BIL to advance and accelerate, to the extent possible, bus transformation.

# COMMUTER RAIL TRANSFORMATION

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.<sup>22</sup> The system relies on 100% diesel locomotives to bring commuters into the city core with two main terminals—South and North Station—with peak headways between 20 minutes/20-50 minutes and off-peak headways between 40 minutes and 1-2/hours.<sup>23</sup> In 2018, with growing congestion in the region and the Commonwealth’s decarbonization goals, the FMCB called on the MBTA to “transform the current commuter rail line into a significantly more productive, equitable, and decarbonized enterprise.”<sup>24</sup>

## RAIL TRANSFORMATION OFFICE

**MODERATE PROGRESS:** ●

As per the FMCB, a Regional Rail Transformation Office was formed.<sup>25</sup> The Rail Vision team would be responsible, amongst other things, for laying the groundwork to implement the Regional Rail Phase I pilot, and from 2018-2020 the team would develop a strategy to achieve the stated outcomes. Staffing of the Office remains bare-bones, a deep cause for concern.

## PHASE I REGIONAL RAIL

**LIMITED OR NO PROGRESS:** ●

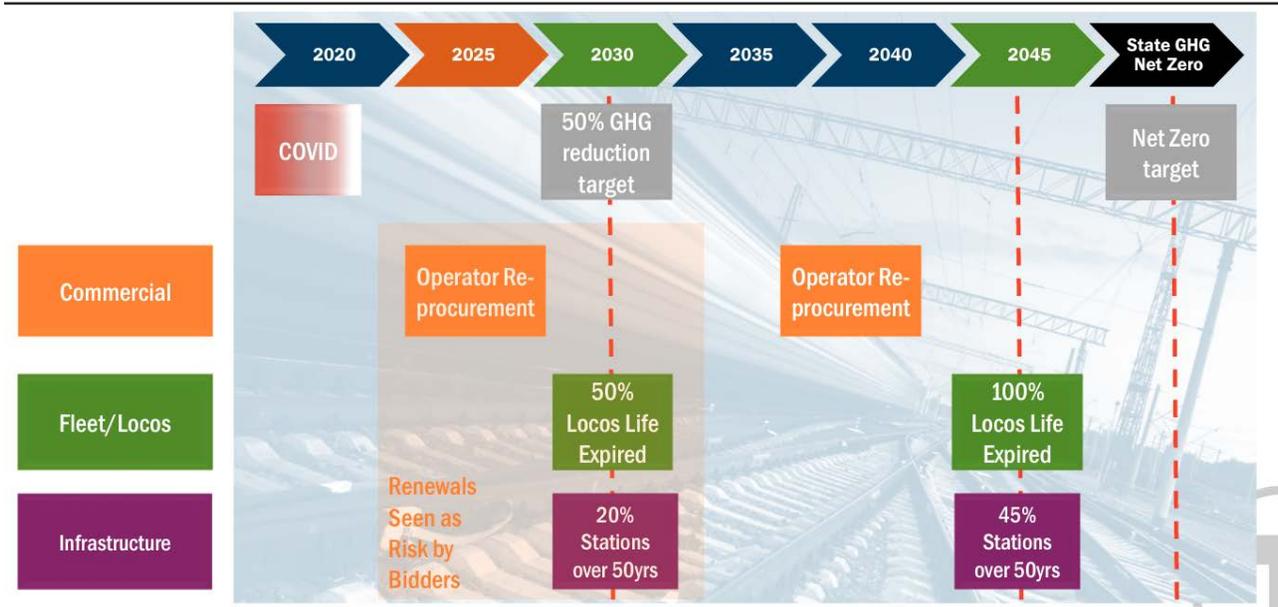
In November 2019, the Rail Vision team presented the FMCB with six alternatives to transform the Commuter Rail ranging from higher frequency service (Alternative 1) to full transformation of the system (Alternative 6) with the delivery of the final report in February 2020.<sup>26,27</sup> The FMCB called on the MBTA to take immediate steps to implement Phase I of the three Phase Regional Rail process and to establish a Commuter Rail Transformation Office with the sole purpose of advancing Rail Vision.

In 2020, the MBTA issued a “Request for Information” (RFI) on Electric Multiple Units (EMUs), to get a sense of the industry, EMU designs, and applicability of existing EMUS to a future MBTA commuter rail system. A preliminary presentation of the results was given to the FMCB on June 15, 2020, with a final report due in summer 2020.<sup>28</sup>

The team further set forth to develop a strategy to implement Phase 1 of the transformation effort, which included steps to develop and launch an EMU Pilot on the Providence/Stoughton Line as well as EMU powered service on the Fairmount and the Newburyport/Rockport Line through Lynn (covering Boston, Everett, Chelsea, and Revere and referred to as the Environmental Justice corridor). The latter two lines would also adopt faster headways and lower fares (equivalent to rapid transit) to improve service and affordability for the communities the lines serve.

**FIGURE 5:** Illustrative Schedule: Phase 1 Regional Rail

## Deadline-driven Approach



**SOURCE:** [Regional Rail Transformation Update: EMU Pilot and Phase I Planning Update \(April 12, 2021\)](#)

On April 12, 2021, the Rail Vision team gave a status report to the FMCB on the EMU Pilot and Phase I Planning, outlining a deadline-driven approach to implement first steps for service and planning changes, Boston-Providence EMU Pilot, and Phase I electrification planning (Figure 5).<sup>29</sup> At this time, the MBTA revised commuter rail schedules that improved headways on the Boston to Beverly line and throughout the entire system. In all other areas related to the regional rail, the MBTA appears to be significantly behind their announced plans (Table 3), specifically with the tasks on foundational planning studies, EMU procurement, and conceptual design advancement.

Given these delays, it seems clear that the EMU Pilot service will not go live in 2024 Q2 nor will Phase 1 Service begin in 2029. This will make it difficult for the MBTA to fully decarbonize the commuter rail system and its fleet by 2050.<sup>30</sup> To get back on track, the MBTA will need to update the schedules for these studies and procurements, as well as provide funding in the CIP for Phase 1 plans for electrification of the three commuter rail lines.

**TABLE 3:** Actual Status of Phase 1 Regional Rail Implementation

	TASK	STATUS
<b>EARLY ACTION</b>		
<b>SERVICE CHANGES</b>		<b>COMPLETE</b> New “regional rail” schedule effective April 5, 2021. <sup>31</sup>
<b>TRANSFORMATION PLANNING</b>	Detailed Technology & Electrification Study	<b>STATUS UNKNOWN</b> Estimated delivery 2021 Q3
<b>TRANSFORMATION PLANNING</b>	Fleet & Facilities Needs	<b>STATUS UNKNOWN</b> Underway
<b>TRANSFORMATION PLANNING</b>	Boston-Provide EMU Pilot Feasibility Study	<b>STATUS UNKNOWN</b> Presentation 5/24/21 <sup>32</sup> Estimated delivery end 2021 Q2
<b>PROCUREMENT</b>	Acquire or lease existing Buy America compliant rolling stock for Provide EMU Pilot <ul style="list-style-type: none"> <li>Studying potential modifications required to infrastructure or rolling stock</li> <li>Investigating major procurements that have unneeded options which may be transferable</li> </ul>	<b>STATUS UNKNOWN</b> Status of studies & investigation unknown
<b>PHASE I ELECTRIFICATION</b>		
<b>BOSTON TO PROVIDENCE LINE</b>	Providence Line already electrified to Providence <ul style="list-style-type: none"> <li>Missing 1.7-mile gap at Attleboro station is being filled</li> <li>Potential need for additional feed and transformer station is being modeled</li> <li>Investigating staged introduction of EMUs and impact of new Acela fleet</li> <li>Low bridges are being surveyed for potential conflict with the range of EMUs under consideration</li> <li>Coordination with Amtrak &amp; Utilities</li> </ul>	<b>STATUS UNKNOWN</b> for action items
<b>ALL LINES</b>	Conceptual design work (varies by line)	<b>STATUS UNKNOWN</b> Providence: 2021 Q3-2022 Q1 Fairmount: 2021 Q4-2022 Q2 Boston to Beverly: 2021 Q3 – 2022 Q2

**SOURCE:** Authors based on [Regional Rail Transformation Update: EMU Pilot & Phase I Planning Update \(April 12, 2021\)](#)

When the FMCB called on the MBTA to establish the Regional Rail Transformation Office, they specified that the office “...develop and implement environmental, financial, procurement, current commuter rail operating agreement re-bid and operational strategies as well as others as needed.”<sup>33</sup> 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 most likely a new contract will be awarded in January 2026. Figure 5 allots three years for the re-procurement process starting at the beginning of 2022.<sup>34</sup> The MBTA identified several issues that will impact the bidders risks as well as information to collect to prepare for the bid and facilitate a no-regrets investment. It is unclear what, if anything, has been done to advance preparation of the re-procurement strategy and process, including issuance of an RFI or RFP.

Transformation 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.<sup>35</sup> Phase 1 addresses vital issues that touch upon equity within the commuter rail system both in terms of access and environmental impact. Delaying the implementation of the early actions has a crippling effect on the MBTA’s ability to realize the regional rail vision; therefore, the CIP should allocate sufficient funding these outstanding actions and launch Phase 1.

## RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

1. Provide status report on Regional Rail Office staffing and recruitment.
2. Fund in CIP and provide regular status reports on implementation of early action items, planning studies, and EMU procurement for Providence EMU Pilot and well as electrification actions to advance Phase 1.
3. Provide an update on the status of the re-procurement strategy and preparation.
4. Provide an update on the preparation of the Regional Rail Business Case as well as an analysis and update of potential new funding resources for electrifying rail coming from the recently enacted.

# EQUITY

## MEANS-TESTED FARE PROGRAM

## LIMITED OR NO PROGRESS: ●

The MBTA's fare policy provides a framework to establish and restructure fares, set targets for farebox recovery goals, and defines the relationship of fare revenue to the agency's overarching objectives. In 2015, the MBTA adopted a [fare policy](#) with three main objectives: increase revenue; improve service and customer service; **and advance social, equity, environmental, and regional goals.**<sup>36</sup> The policy, *in accordance with Chapter 161A, addresses fare levels, including discounts, fare equity, and a fare structure, including but not limited to, fare media and passes, and includes a system for free or substantially price-reduced transfer privileges.*<sup>37</sup>

### Commitment under FMCB:

Provide details on ***Means-Tested Pilot Program***, include funding for program in FY23 operations budget, and initiate program initiated by September 1, 2022.

With equity at the center of the Authority's fare policy objectives, the MBTA has been discussing how to implement a means-tested fares program for many years.<sup>38</sup> During its tenure, the FMCB called on the MBTA to prioritize a review and development of a means-tested fare. In 2020, building off preliminary research dating back to 2016, the MBTA staff provided the FMCB with an overview of different options to run a broader means-tested fare program, followed by, and at the request of the MBTA, a [Means-Tested Fare Challenge](#) to identify potential partners for a pilot.<sup>39, 40</sup>

The MBTA staff came back to the FMCB in May 2021 with cost estimates to run a Means-Tested Fare program, including information of program scope, implementation timeline, and two pilot design concepts.<sup>41</sup> The estimates ranged from \$52M-\$85M (not added bus or rapid transit service) and \$72M-\$112M (adding bus and rapid transit service) with a three year implementation timeline, and the partnership models included a Community-Based Organization approach and an MBTA centric approach with support from Health and Human Services (HHS). The FMCB directed the MBTA to finalize details on the pilot program to be funded in FY23 operations budget and launched on September 1, 2022. This deadline was not met. The MBTA staff updated the new MBTA Board of Directors on February 24, 2022, but no decision was made with respect to program implementation.<sup>42</sup> It is clear the MBTA is not intending to meet this promise.

## RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

1. Take immediate action to identify partner, funding source, and timeline for implementation of Means-Tested Fare pilot.
2. Include funding for Means-Tested Fare pilot in the FY23 operations budget & program and launch by September 1, 2022.

# INFRASTRUCTURE

## RED LINE & ORANGE LINE TRANSFORMATION

MODERATE PROGRESS: ●

Under the leadership of the MBTA's FMCB, the MBTA created a new organizational structure to oversee the massive \$2.1 billion investment in new vehicles and infrastructure upgrades, dubbed the Red Line/Orange Line Transformation program. (*nb*: Under the new MBTA Board of Directors, “both the Red and Orange Line transformation programs have been consolidated under the Capital Transformation Program”<sup>43</sup>)

The MBTA's commitment for the Red Line/Orange Transformation has been widely publicized and specific that by 2024 the Red Line would operate with 95 percent reliability at 3-minute headways, with the Orange Line at 96 percent reliability at 4.5-minute headways.<sup>45</sup> Under a contract originally executed in 2015 to buy replacement vehicles for the Red and Orange Lines, 404 new cars are scheduled to enter service by 2024 at a projected cost of about \$1 billion dollars.

The pandemic has interfered with the pace of the MBTA's Red and Orange Line Transformation project, impacting both schedule and cost. The MBTA reclassified the program into two phases. Phase 1 will include all previously committed design and construction work consisting of new vehicles and infrastructure upgrades, exhausting the available \$2.1 billion and running through the end of FY23. The MBTA still aims to meet the headway targets by 2024 but has delayed the reliability targets until 2029.

In the last update for the FMCB on the Red Line/Orange Line Transformation Program on January 25, 2021, the MBTA released these upcoming targets for completion between 2022 – 2024 (Table 4)<sup>46</sup>

### Commitment under FMCB:

The FMCB adopted a modernization/State of Good Repair (SGR) combined approach. The strategic intent is not to repair facilities and services to their original intent but for the region's needs today and into the next decades. This is best demonstrated by the example of the Red Line where we committed to improving peak period headways from five minutes to three minutes. That commitment requires a premium be spent on more cars, better signaling, more robust power etc.<sup>44</sup>

**TABLE 4:** Timeline for Red Line/Orange Line Transformation Program

PROJECT NAME	INVESTMENT TYPE	TARGET COMPLETION
<b>RED LINE/ORANGE LINE FLEET PROCUREMENT</b>	Procurement of heavy rail vehicles to expand capacity & improve reliability	Fall 2024
<b>RED LINE TEST TRACK</b>	Construct delivery track, test track, & Vehicle Testing Facility (VTF) for new Red Line vehicle testing	Winter 2021
<b>CABOT YARD &amp; MAINTENANCE FACILITY IMPROVEMENTS</b>	Replacement of all elements in the existing Yard to allow for safe operation, proper maintenance, & reliable service.	Fall 2022
<b>CODMAN YARD EXPANSION &amp; IMPROVEMENTS</b>	Replace existing tracks, signals, & power infrastructure in kind to address reliability & modernization needs. Install 6 additional tracks to support increased new fleet size	Summer 2024
<b>WELLINGTON YARD &amp; MAINTENANCE FACILITY</b>	Rehabilitation, modernization & expansion of existing Facility to support augmented vehicle fleet. Replacement of all yard elements in the existing Yard to allow for safe operation, proper maintenance, & reliable service	Summer 2022
<b>RED LINE/ORANGE LINE MAINLINE SIGNALS UPGRADE</b>	Upgrade & modernize signaling & train control systems to support the delivery of the new vehicles.	Red Line: Winter 2022 Orange Line: Spring 2022
<b>RED LINE FLOATING SLABS</b>	Repair & Maintenance of Track	Spring 2021
<b>ALEWIFE CROSSOVER IMPROVEMENTS</b>	Replace track crossings between Alewife & Davis stations	Fall 2022
<b>ORANGE LINE TRACTION POWER UPGRADE</b>	Modernization of 4 Traction Power Substations (TPSS) capable of supplying power to the new fleet	Fall 2025
<b>RECOVERY EFFORT</b>	Recovery effort for JFK Red Line Derailment & Cabot Flood Mitigation	December 2019 & Spring 2021

**SOURCE:** [Red Line/Orange Line Transformation Program Update, January, 2021](#)

A Better City reviewed key aspects of the MBTA's Red Line and Orange Line signals upgrade project and considered the imperative for the system to adapt to the now certain impacts of climate change, including sea-level rise, by adopting a more resilient, next-generation signal system. In a recent report, [\*Positive Signals: A Framework for Advanced Signals & Control for the MBTA Red and Orange Lines\*](#), we determined the MBTA will require approximately \$700 million in newly identified, but currently unfunded dollars. This money is necessary to achieve the recommendations from the January 2021 FMCB presentation, the new Phase 2 work of additional investments in track and power system repairs and upgrades needed to meet the reliability targets.

This report also recommends the MBTA undertake a new Platform Screen Doors Pilot Project at several key Red Line and Orange Line stations in the downtown Boston core at a cost of approximately \$25 million. Otherwise, the system will be unable to reach the ambitious headway goals established under the FMCB. Platform Screen Doors are used in many world-class transit systems to enhance passenger safety (by preventing accidental and other falls into the track pits), to improve passenger flow and reduce dwell time, and to enable the installation of air conditioning to help enhance the transit experience, a benefit customers may increasingly expect as temperatures continue to increase due to climate change. If the MBTA can achieve semi-automatic berthing (i.e., station stopping not guided solely under human control), then the system should pilot the installation of Platform Screen Doors along the length of several station platform

## RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

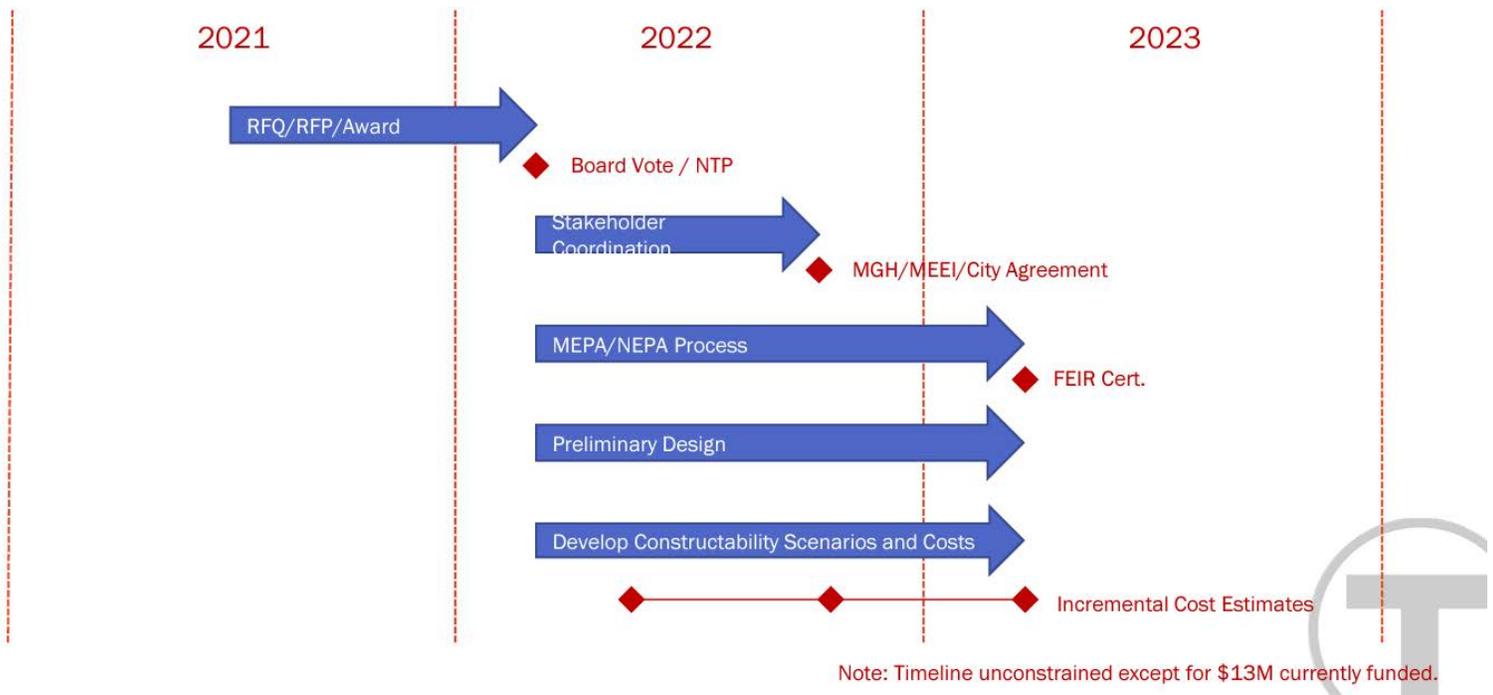
1. Provide updated timeline for the existing Red Line/Orange Line Transformation Goals.
2. Provide updated timeline for receipt of all 252 new Red Line vehicles.
3. Provide updated timeline for receipt of all 152 new Orange Line vehicles.
4. Add funding into the CIP to support platform screen door infrastructure at multiple Red and Orange Line stations and signal upgrades to incorporate modest amounts of semi-automatic capability in routine train operations.

In June 2021, the MBTA presented an update to the Red-Blue Connector project.<sup>47</sup> This important initiative has been under discussion and consideration for 50 years and if undertaken would fill an existing infrastructure and mobility gap connecting the MBTA's Red and Blue Lines.

The MBTA achieved a conceptual design with the preliminary cost estimated at \$850 million. They also presented a tentative project timeline to complete construction by 2030 with several near-term actions (Figure 6) such as hiring dedicated project staff; advancing permitting; and coordinating with stakeholders.

**FIGURE 6:** Red-Blue Connector Near-Term Timeline

## Near Term Timeline



**SOURCE:** [Red Blue Connector, Presentation to FMCB, June 7, 2021](#)

It appears this work is moving forward with delays. The MBTA is now advertising a contract for preliminary Engineering & Environmental Review.<sup>48</sup> Once this contract is awarded, the MBTA could then focus on potential opportunities for federal infrastructure grants to assist with the funding for this project and develop a preliminary design. Currently, full funding for the construction of project is not identified, nor is funding included in the five-year capital plan to move the project beyond initial design. The draft-CIP includes \$15 million for planning and initial design-only, but there should be funding reserved for future years to fund the project after initial design is complete.

## RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

1. Award the contract for Preliminary Engineering & Environmental Review.
2. Hold a Board Vote in 2022 to approve a Notice to Proceed. Include additional funding in the CIP to award a design/build contract by 2024.

### NEW GREEN LINE VEHICLES

**SIGNIFICANT PROGRESS:** ●

The FMCB left the MBTA and new Board of Directors a set of recommendations “to explore the potential of further productivity improvements, made possible by smart capital investments and advancements in technology.”<sup>49</sup> The report looks at efficiency gains from vehicle type (Green Line, Commuter Rail, Bus), subway automation and platform screen doors, fare transformation, regional rail transformation (including electric rail fleet), bus priority transit (BRT), amongst others. This section focuses on the procurement of new Green Line vehicles.

In the June 2021 FMCB Productivity Report, the FMCB recommends the MBTA upgrade the existing Green Line cars to “Type 10 Supercars”, which will allow for faster and more reliable service. They wrote:

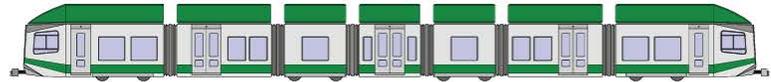
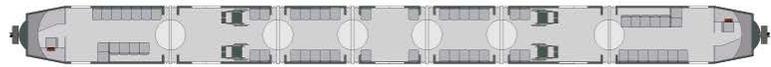
*The Type 10 is an “off the shelf” vehicle that carries in one car the same number of passengers that the MBTA currently serves with two bespoke vehicles. From a passenger capacity standpoint, the new cars eliminate/reduce many of the most expensive components on a train, such as operators’ cabs, brake components, and couplers. Fewer vehicles require fewer inspections and shorter preventative maintenance cycles. Using the latest propulsion and braking technology would enable more efficient energy consumption and therefore reduced utility costs. Additionally, system standardization and one-fleet operation would reduce maintenance and operations training costs as well as material costs. Finally, the Type 10 Supercars deliver the same carrying capacity and reliability with fewer operators. Each Supercar requires one fewer operator than does a two-car legacy train.<sup>50</sup>*

**TABLE 7:** Type 10 Supercar

## Type 10 Supercar | *Forging Ahead* Outcomes

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Type 10 Vehicle	Procurement	Design				Pilot	Vehicle Rollout					

- ✓ Vendor bid proposals to be submitted on July 14, 2021
- ✓ An addenda was sent out changing the **base contract to 102 cars** from the original 165 car base order
- ✓ **Options have increased** to reflect the new base order quantity
- ✓ We anticipate to have good competition from multiple car builders



*Type 10 Supercar: conceptual rendering*

- + Low floors to allow for an accessible vehicle
- + Replace legacy fleet
- + Reduced dwell times
- + Allows for improved operations and maintenance

**SOURCE:** [Green Line Transformation Update, June 21, 2021](#)

In November 2021, the MBTA announced they intend “to award a Notice to Proceed for construction of the new Type 10 cars in 2022 and would hope to have these in service in 2026”.<sup>51</sup> It is unclear if the current schedule is consistent with the details from 2021, but the draft CIP does include significant funding for this initiative. There is \$311 million to procure 102 vehicles, as well as additional funding to support power upgrades and modernization of maintenance facilities to accommodate the Type 10 cars. Beyond keeping the CIP funding in place, there are still actions the new MBTA Board should expect to show this project remains a top priority.

### RECOMMENDED NEXT STEPS

The Board should consider the following next steps:

1. Award the Notice to Process for the Type 10 Vehicles.
2. Update the public on the schedule for these vehicles.

# CONCLUSION

In October 2021, the current MBTA Board of Directors met for the first time. They are now responsible for overseeing the transit agency's new challenges, such as recovery from COVID-19, and guiding the process for a future program of work. But they are also the custodians of the commendable work performed over the past six years under the FMCB. This new board is now expected to follow through on the initiatives started years ago, reach the milestones established, and bring the FMCB's vision closer to reality.

While it is the prerogative of the Board to develop its own governance style and strategic priorities, A Better City urges the new Board to consider following the detailed, strategic vision established by the FMCB and to keep these MBTA's commitments as they were presented during public meetings. This work represents years of strategic planning and public promises, which are now beginning to show results, and should not be disregarded.

Public transit has a vital role to play in supporting the Commonwealth's economic recovery. The region needs a stronger MBTA to support our residents, commuters, and economy. The MBTA must be ready, now, to provide riders with the safe, adequate, reliable, and affordable service they need to transition back to the workplace, enjoy the sites Greater Boston has to offer, and fully embrace the new normal.

These prior commitments, as highlighted in this report, are fundamental to both the MBTA's short- and long-term success as well as the Commonwealth's ambitious climate resilience and decarbonization goals. To see a summary of the recommended next steps, continue to the next page of this report. The new Board and the MBTA must not shy away from these ambitious visions. Let's keep the MBTA on Track for success by taking the required next steps, including adequate funding in the CIP, to build a 21<sup>st</sup> Century public transit system that serves the region today and tomorrow.

# SUMMARY OF RECOMMENDED NEXT STEPS

FMCB COMMITMENT	RECOMMENDED NEXT STEPS
<b>SAFETY</b>	<ul style="list-style-type: none"> <li>• Provide a public update on the anticipated next steps for all Safety Review Panel recommendations that are currently on hold.</li> <li>• Provide a cost estimate and expected timeline to fully implement Safety Review Panel recommendations and maintain a system that meets the Panel's safety levels and requirements.</li> <li>• Develop an externally facing dashboard to report on Safety Review Panel recommendations.</li> </ul>
<b>RESILIENCY</b>	<ul style="list-style-type: none"> <li>• Provide a comprehensive status update on each assessment.</li> <li>• Provide a detailed implementation plan for addressing and tracking the findings and recommendations (short-, medium-, and long-term) identified in the assessments.</li> <li>• Explain the CIP climate resiliency score process and impacts to date.</li> <li>• Provide a 10 year cash flow needs analysis to ensure adequate resources are available in a timely fashion.</li> <li>• Provide an update on how the MBTA plans to take advantage of BIL funding and competitive grants to risk assessment and capital projects to accelerate climate resiliency work.</li> </ul>
<b>DECARBONIZATION</b>	
<b>BUS TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Provide regular progress reports on:               <ul style="list-style-type: none"> <li>• Pending bus procurements, including EEH, Silver Line, BEB RFP and Technical Specifications, and future bus procurements; and</li> <li>• Bus facility modernization strategy timeline (planning, design, construction)</li> <li>• MBTA bus facility real estate strategy.</li> </ul> </li> <li>• Provide overview of MBTA preparation and plans for BIL to advance bus transformation.</li> </ul>
<b>COMMUTER RAIL TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Provide status report on Regional Rail Office staffing and recruitment.</li> <li>• Fund in CIP and provide regular status reports on implementation of early action items, planning studies, and EMU procurement for Providence EMU Pilot and well as electrification actions to advance Phase 1 (conceptual designs).</li> <li>• Provide an update on the status of the re-procurement strategy and preparation.</li> <li>• Provide an update on the preparation of the Regional Rail Business Case as well as an analysis and update of potential new funding resources for electrifying rail coming from the recently enacted BIL.</li> </ul>
<b>EQUITY</b>	
<b>MEANS-TESTED FARE PILOT</b>	<ul style="list-style-type: none"> <li>• Take immediate action to identify partner, funding source, and timeline for implementation of pilot.</li> <li>• Include in FY23 operations budget &amp; program and launch by September 1, 2022.</li> </ul>
<b>INFRASTRUCTURE</b>	
<b>RED LINE/ORANGE LINE TRANSFORMATION</b>	<ul style="list-style-type: none"> <li>• Provide updated timeline for the existing Red Line/Orange Line Transformation Goals.</li> <li>• Provide updated timeline for receipt of all 252 new Red Line vehicles.</li> <li>• Provide updated timeline for receipt of all 152 new Orange Line vehicles.</li> <li>• Add funding into the CIP to support platform screen door infrastructure at multiple Red and Orange Line stations and signal upgrades to incorporate modest amounts of semi-automatic capability in routine train operations.</li> </ul>
<b>RED-BLUE CONNECTOR</b>	<ul style="list-style-type: none"> <li>• Award the contract for Preliminary Engineering &amp; Environmental Review.</li> <li>• Hold a Board Vote in 2022 to approve a Notice to Proceed. Include additional funding in the CIP to award a design/build contract by 2024.</li> </ul>
<b>NEW GREEN LINE VEHICLES</b>	<ul style="list-style-type: none"> <li>• Award the Notice to Process for the Type 10 Vehicles.</li> <li>• Update the public on the schedule for these vehicles.</li> </ul>

# APPENDIX I: LEVERAGING FEDERAL INFRASTRUCTURE FUNDS

MBTA PROJECT	FEDERAL FUNDING OPPORTUNITY
SAFETY	<ul style="list-style-type: none"> <li>Unknown</li> </ul>
RESILIENCY	<ul style="list-style-type: none"> <li>PROTECT Program</li> </ul>
DECARBONIZATION	<ul style="list-style-type: none"> <li>Bus and Bus Facilities</li> <li>Low-No-Emission Bus Program</li> <li>Nationally Significant Freight &amp; Highway Projects (INFRA)</li> <li>Federal-State Partnership for Intercity Passenger Rail Grants</li> <li>Restoration &amp; Enhancement Grant Program</li> <li>Local and Regional Project Assistance Grants (RAISE)</li> <li>Capital Investment Grants</li> <li>Charging and Fueling Infrastructure Grants (Community Charging)</li> <li>Consolidated Rail Infrastructure and Safety Improvement Grants (CRISI)</li> </ul>
EQUITY	<ul style="list-style-type: none"> <li>Unknown</li> </ul>
INFRASTRUCTURE	<ul style="list-style-type: none"> <li>MEGA</li> <li>Rail Vehicle Replacement Grants</li> <li>Federal-State Partnership for Intercity Passenger Rail Grants</li> <li>Restoration &amp; Enhancement Grant Program</li> <li>Local and Regional Project Assistance Grants (RAISE)</li> <li>Capital Investment Grants</li> <li>Nationally Significant Freight &amp; Highway Projects (INFRA)</li> </ul>

**NOTE:** Preliminary list of ideas for identified for funding sources

# APPENDIX 2: KEY SOURCES

## SAFETY

[MBTA Safety Review Panel Report Update \(February 10, 2022\)](#)

[MBTA Safety Review Panel Report: One-Year Lookback](#)

[MBTA Safety Review Panel Report](#)

[MBTA T Dashboard](#)

## RESILIENCY

[Massachusetts Clean Energy & Climate Plan for 2025 & 2030](#)

[No. 569: Establishing an Integrated Climate Change Strategy for the Commonwealth](#)

[Massachusetts 2050 Decarbonization Roadmap](#)

[MBTA Fiscal & Management Control Board Strategic Plan](#)

[MBTA & MassDOT Transit Asset Management Plan](#)

[MBTA Strategic Planning Report](#)

[MBTA Fiscal & Management Control Board Strategic Plan](#)

[MBTA Sustainability Report](#)

[MBTA Future Proofing Transit: Advancing Climate Resiliency](#)

[MBTA Resiliency Program Review](#)

[MBTA Climate Resiliency Program](#)

[Weston & Sampson RMA Draft Climate Resilience Design Standards & Guidelines](#)

[Weston & Sampson Orange Line Climate Change Vulnerability Assessment](#)

[Weston & Sampson | MBTA](#)

[Weston & Sampson Climate Resiliency Climate Modeling](#)

[Weston & Sampson MBTA Bus Maintenance Facilities Resilient Design Guidelines](#)

[STV Climate Change Vulnerability Assessment & Adaptation Support](#)

[BSC Group MBTA Pump Room Assessment & Environmental Engineering](#)

[MassDOT Flood Risk Assessment Objectives](#)

[MBTA Preview of the Capital Investment Plan \(CIP\)](#)

[The ‘What’ & ‘Why’ Of An Environmental & Sustainability Management System \(ESMS\)](#)

## **DECARBONIZATION**

[Massachusetts 2050 Decarbonization Roadmap](#)

[MBTA Energy Management](#)

[MassDOT Tracking the Energy & Emissions of MBTA Rapid Transit Vehicles](#)

[MBTA Greening the Fleet: Decarbonizing the MBTA](#)

## **BUS TRANSFORMATION**

[MBTA Bus Network Redesign](#)

[MBTA Bus Electrification](#)

[MBTA Bus Transformation Update Part 1: Fleet & Facility Update](#)

[MBTA Bus Transformation Part 2](#)

[MBTA Bus Electrification: Battery Electric Bus Performance](#)

## **COMMUTER RAIL TRANSFORMATION**

[MBTA Rail Vision](#)

[MBTA & MassDOT Peer Systems Review](#)

[MBTA & MassDOT Fiscal & Management Control Rail Vision Final Vote](#)

[MBTA & MassDOT Rail Vision Fiscal & Management Control Board Presentation](#)

[MBTA Rail Vision Final Report](#)

[MBTA Electric Multiple Units RFI Update](#)

[MBTA Regional Rail Transformation Update: EMU Pilot & Phase 1 Planning Update](#)

[MBTA Regional Rail Transformation: Boston-Providence EMU Pilot Update](#)

[Transit Matters Regional Rail](#)

[MBTA commuter rail could be electrified for between \\$800 million & \\$1.5 billion according to new report](#)

[Transit Matters Regional Rail Electrification: Costs, Challenges, Benefits](#)

## **EQUITY**

[MBTA & MassDOT Fare Policy](#)

[MBTA & MassDOT: FY 2017 Proposed Fare Changes](#)

[MA Legislature Chapter 164 An Act Relative to MBTA Fare Increases](#)

[MBTA FY19 Final Itemized Budget](#)

[MBTA Feasibility of Means-Tested Fares](#)

[MBTA Means-Tested Fares Feasibility Study Update](#)

[MBTA Fare Policy Updates](#)

[MBTA Alternative Fare Proposals](#)

## **INFRASTRUCTURE**

[MBTA Red-Blue Connector](#)

[MBTA Fiscal & Management Control Board Productivity Report](#)

[MBTA Fiscal & Management Control Board Productivity Report Final Accessible](#)

# SOURCES

1. <https://www.bostonglobe.com/metro/2019/06/11/mbta-among-nation-worst-for-derailments-records-show/0BIFgd4YmRykjOYXYqcKbM/story.html>
2. Former US transportation secretary Ray LaHood; former Federal Transit Administration acting administrator Carolyn Flowers; and former NYC Transit president Carmen Bianco. See: <https://blog.mass.gov/transportation/mbta/mbta-safety-review-panel-recommendations-to-fmcb-to-improve-safety-for-t-riders-employees/>
3. MBTA Safety Panel Report Update to MBTA Board of Directors, February 10, 2022, page 6.
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11. <https://www.mbta.com/sustainability/energy-management>
12. <https://www.mbta.com/sustainability/greening-the-fleet-decarbonizing-the-mbta>
13. Recent estimates show substantial funding needs over the course of the next ten years to advance but not complete transformation of \$3.674 billion for bus transformation, and \$2.433 billion of rail transformation. Unconstrained 10-year budget slide.
14. [Bus Transformation Goals](#)
15. <https://cdn.mbta.com/sites/default/files/2021-04/2021-04-26-fmcb-6-bus-transformation-up-date.pdf>
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This office shall contain responsibility for all short, medium- and long-term elements of transformation including developing and maintaining the business case to support the investments needed. This office shall develop and implement environmental, financial, procurement, current commuter rail operating agreement re-bid and operational strategies as well as others as needed. This office shall be responsible for developing and implementing a stakeholder engagement plan. The staff shall have no other responsibilities outside the transformation mission.
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