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THE PATH TO A SAFE AND RELIABLE TRANSIT SYSTEM JUST GOT A LOT LONGER

INTRODUCTION

On November 16, the MBTA presented an updated analysis of its State of Good Repair (SGR) Index, which measures the Authority’s capital asset needs, to the Board of Directors ([here](#)) in which it revised the SGR Index to \$24.5 billion from the most recent \$10 billion estimate presented in 2019. The presentation and discussion with the Board raised a bevy of unanswered questions regarding the impact of the new findings to those who follow the Authority’s progress and the implications for a safe and reliable transit system.

This brief addresses several points from the presentation:

- What’s included in the new SGR as well as what is not,
- What changed since the 2019 calculation to cause such a sizable increase, and
- Why the revised SGR estimate should concern lawmakers, employers, and transit riders.

In the coming months, the MBTA plans to analyze the impacts of the updated SGR Index and use it to revise its estimate of necessary capital spending, stating:

Moving forward, we envision a transportation system of the future that is safe, reliable, electrified, resilient and accessible. Understanding our SGR needs, and the level of investment required to address them is a step toward fixing the transit system, reestablishing public trust, and advancing our modernization goals (Slide 21).

As we await these findings, it is critical to contextualize this SGR figure and assess what it means for our transit system. Fortunately, in June 2021, the MBTA released a capital needs assessment that delivers the modernization outcomes listed in the statement above, describing the 10-year framework as¹:

- “A high level approximation of the capital cost of the MBTA’s public commitments and plans over the next 10+ years;
- Inclusive of the Authority’s current program, an estimate of funding needed to meet state of good repair and transformation program public commitments (many of which extend beyond the 10 year window), and initial estimates for a portfolio of future modernization and expansion efforts” (for more details, see Table 2 and Appendix B.)

¹ Unconstrained 10-year [Capital](#) Investment Framework, Slide 6, FMCB, June 7, 2021. SGR Index was \$10 billion.

In this brief, using the MBTA's Unconstrained 10-year Capital Investment Framework from 2021 as a benchmark, we quantify the potential fiscal impacts of the revised SGR index, cite requisite caveats to be considered, and present a brief list of realities and recommendations, as we grapple with this sobering update to the condition of the MBTA.

WHAT'S INCLUDED IN THE \$24.5 BILLION SGR INDEX. WHAT'S LEFT OUT?

The MBTA reviewed the condition of an expanded list of assets and estimated a replacement cost of assets that are not in an SGR with an equivalent asset. Equivalence is the point of the exercise as the associated costs do not include upgrades or better performing assets (Appendix A provides a breakdown of the \$24.5 billion SGR Index by asset). Therefore, the list of what is *not* included in the SGR Index estimate is extensive, important for policymakers to keep in mind, and has vital implications for future MBTA performance.

The \$24.5 billion SGR index does not include major cost components for a modernization effort as opposed to replacement in kind, including infrastructure modernization, electrifications, regulatory compliance, and climate resiliency. The MBTA also notes, "This analysis does not yet include information technology, communications assets, security assets, or business and operational support programs, although these may be included in future analyses."

For clarity, the MBTA lists the following matters as excluded in the SGR Index ([here](#), slide 6):

- Accessibility and Legal Requirements – Renovation of stations to add accessibility features and bring them into compliance with current ADA standards, including "trigger" upgrades that would require full station renovation
- Sustainability and Resilience – Waterproofing and flood mitigation, energy management systems, drainage improvements, fleet electrification, and other sustainability and severe weather resilience measures
- Customer Experience Enhancements – Technology enhancements, installation of electric chargers in parking areas, new customer amenities, increased frequency of service
- System Expansion – Extension of a line or addition of a transfer to other modes and/or lines on the transit system

WHAT CHANGED SINCE 2019

The approach for calculating the SGR Index has changed since the most recent estimate, and this change in methodology explains part of the significant cost increase. The MBTA cites four drivers that caused the SGR Index increase to \$24.5 billion ([here](#), slide 13):

1. The number of assets: the MBTA's data collection and asset management system disaggregated some assets into their components for greater clarity and predictive capabilities. In all, the number of assets jumped to 83,683 from 59,073 in 2019.

In one example, the MBTA cites a jump in power asset count from 4,959 in its 2019 assessment to 14,514 in 2023 noting that the older figure did not include "DC cable, AC cable, overhead catenary, South Boston power station, emergency generators, or High Voltage Yard."

Similarly, Commuter Rail signals count soared from 940 in 2019 to 17,598 in 2023 in order to “capture individual switch machines and signal houses, rather than groupings of assets”.

2. Inflation: the MBTA factored higher levels of inflation in infrastructure and construction costs that rose nearly 20 percent from 2019 through Q1 2022, into its SGR Index. The MBTA expects inflation to slow to 5-6 percent in FY 2024 and 3-4 percent in FY 2025
3. Asset condition: Assets are falling out of good repair faster than the MBTA can replace them causing an increase in the number of assets added to the SGR Index. This is due in large part because of inadequate capital investments. Spending on reliability and modernization projects averaged \$675 million annually from FY 2016 – FY 2019, or half what the MBTA suggested was needed when it released its 2019 SGR report.
4. Time: the SGR Index is a snapshot in time that reflects existing asset condition and does not capture what’s in process. For example, the revised SGR Index includes 35 older Green Line coaches out of good repair at the time of the analysis and does not capture the 11 new replacement coaches the MBTA received in June 2023.

Table 1 compares the results from the MBTA’s SGR Indices of 2019 and 2023 by asset type.

Table 1 – MBTA SGR Indices, 2019 and 2023²

	2019	2021	Delta
Bridges, Tunnels, and Culverts	3,944	5,265	1,321
Facilities, Stations and Parking	1,813	6,357	4,544
Track, Signals, and Power	2,192	10,443	8,251
Rolling Stock and Equipment	2,193	2,434	241
Total	10,142	24,499	14,357

WHY IT MATTERS

The Boston Globe called the MBTA’s \$24.5 billion SGR backlog ‘gobsmacking’. Whatever adjective you choose, it is a big number. However, aside from the dollar value, it is important to note that, according to the MBTA’s analysis, two-thirds of their assets are not in good repair ([here](#), slide 7), a sobering statement of how long and challenging the path to a well-functioning system is.

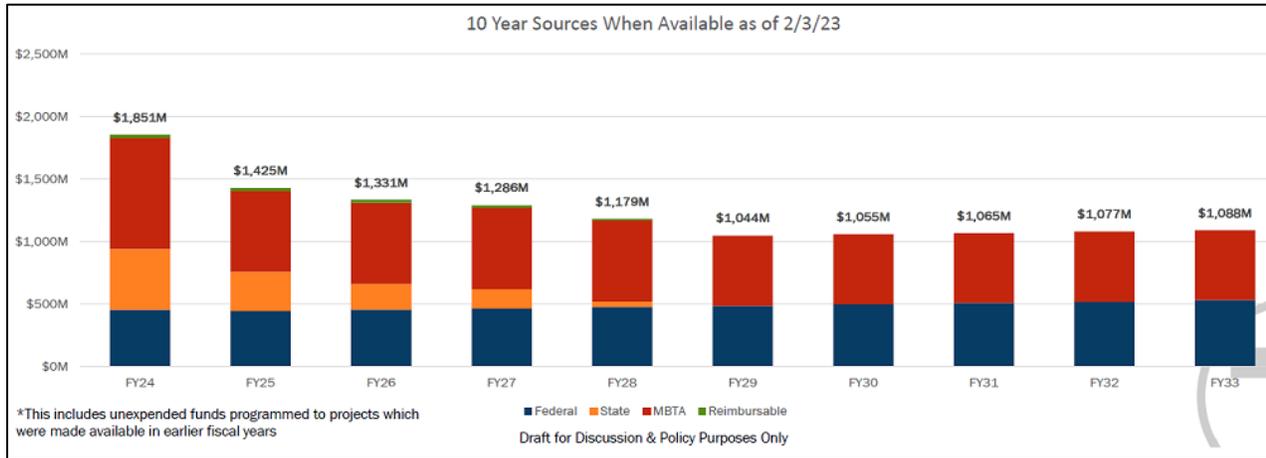
Any rider, frustrated by vehicle breakdowns, smoke, fires, broken elevators and escalators, slow zones, and hazardous incidents understands that the lack of well maintained, updated and functioning MBTA equipment means that it cannot consistently provide safe and reliable service.

In 2019, the MBTA, operated under the assumption that capital spending of \$1.4 billion annually on reliability and modernization projects over a period of 15 years would reduce what was thought to be a \$10 billion backlog to a point where poor asset conditions would not impact service delivery. However, this strategy was fundamentally flawed in two ways.

² The MBTA’s 2019 [Capital Needs Assessment](#) employed a different methodology in its calculation of the SGR Index that included costs of modernization, accessibility, and soft costs such as planning, design, administration, field inspection, bus diversion and more making comparisons with the 2023 version problematic.

First, the MBTA, based on existing resources, will not have \$1.4 billion in available capital sources to spend. Starting in FY 2026, after funds for the purchase of Orange and Red Line Vehicles and infrastructure improvements, new Green Line vehicles, and two expansion projects – South Coast Rail and the Green Line Extension – are spent, MBTA capital sources are limited to the sale of revenue bonds and matching federal formula funds. When this happens, MBTA capital sources fall to just over \$1 billion, well short of the annual amount needed to fulfill even the original \$10 billion SGR investment plan (Figure 1).³

Figure 1 – MBTA Capital Source Assumptions, FY 24 – FY 33⁴



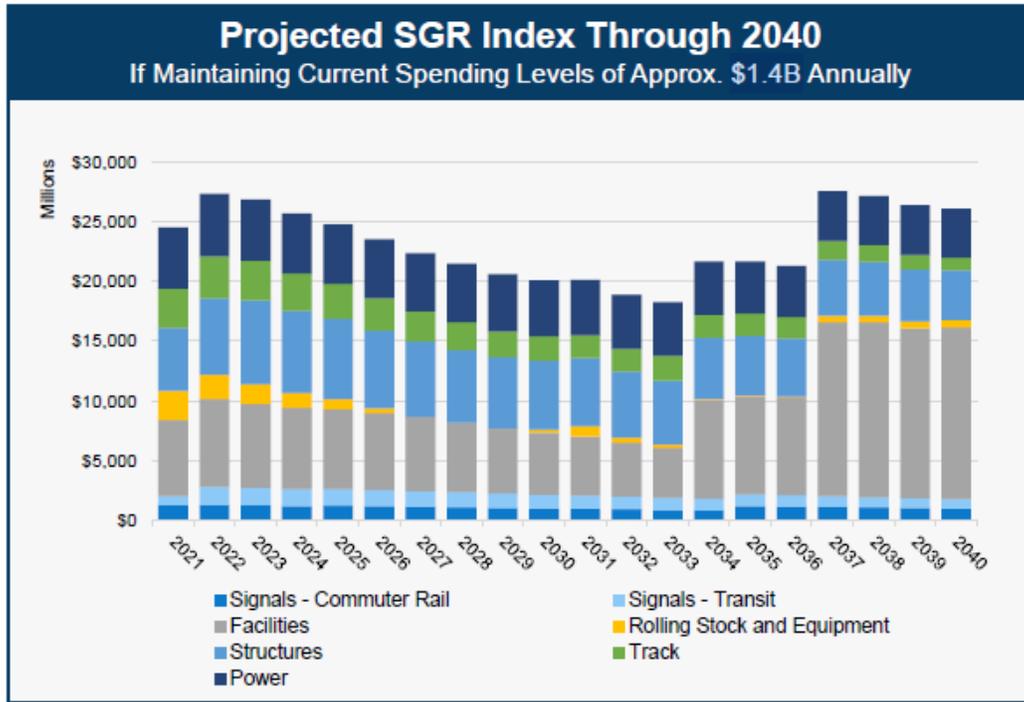
As shown in Figure 2 below, factoring in the \$14.5 billion increase to the SGR Index, even if the Authority could spend \$1.4 billion annually on its SGR backlog, the MBTA projects that assets not in good repair would bottom out at approximately \$17 billion in FY 2033 before rising above \$25 billion in FY 2037.

In this scenario, the MBTA never escapes from the point where a majority of its assets are out of SGR, leaving future riders with a broken transit system for decades. The consequences would be catastrophic to the regional economy and the impacts would fall on transit-dependent communities and those who have few affordable transportation alternatives.

³ Includes the increase in federal formula funds from the Bipartisan Infrastructure Law

⁴ FY24-28 Capital Investment Plan, Slide 15, Presentation to MBTA Board of Directors, June 8, 2023.

Figure 2 – Projected SGR Index through 2040 with \$1.4 Billion in Annual Capital Investment⁵



As MTF noted in its recent report, Urban Cities on the Precipice: A Tale of Six Cities, activity metrics in Northeast and Midwest economic hubs are running 30 to 40 percent below pre-COVID activity. In Boston, rail ridership and foot traffic remain 30 percent below 2019 placing financial stress on employers, commercial real estate owners, and city finances. If the MBTA cannot return to safe and reliable service, the Boston economy cannot recover.

AND NOW FOR THE SCARY PART – WHAT’S NEEDED

As noted earlier, big as the jump to the new \$24.5 billion SGR Index is, it does not include needed investments in modernization, electrifications, accessibility, climate resiliency or expanded services, among a host of other matters. Fortunately, in 2021, the MBTA released a potential spending plan that did address all these issues if resources were available.

In a June 2021 report (Table 2), the MBTA released a 10-year ‘unconstrained capital investment framework’ that incorporated funding for the \$10 billion SGR Index while also covering the projected costs for projects targeting accessibility and legal requirements, climate resilience, electrifications, bus transformation, Rail Vision Phase 1, increased capacity on the Green Line, reduced headways on the Red and Orange Lines, and expansion costs for South Coast Rail, GLX, and the Red/Blue Connector.

⁵ Capital Needs Assessment and Inventory, Slide 16, Presentation to MBTA Board of Directors, November 16, 2023.

By incorporating all projects that the MBTA committed to deliver, this release (Table 2) thereby represents the best estimate of capital costs for all selected projects over the 10 years FY 2022 – FY 2031. This total projected spending need came to \$26.5 billion.

Table 2 – MBTA’s Unconstrained 10-year Capital Investment Framework ⁶

Mode	Program	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	TOTAL
Bus	Bus Transformation	181	422	445	374	310	350	444	287	430	430	3,673
Rapid Transit	Red / Orange Line Transformation	364	636	428	280	139	347	333	333	229	229	3,318
	Green Line Transformation	230	272	234	157	212	292	307	311	271	390	2,676
Rail	Rail Transformation	25	135	163	344	370	480	94	774	46	3	2,434
Systemwide	Bridge and Tunnel	202	202	202	202	202	202	202	202	202	202	2,020
	Power	269	233	313	140	171	188	185	185	69	98	1,851
	Accessibility Resiliency	67	104	82	306	302	305	295	295	295	295	2,346 750
Other Assets*	Fare Transformation, Technology, Safety/Security, The RIDE, Ferry, and Mattapan Line,	749	626	464	464	464	464	464	464	464	464	5,087
Expansion	GLX, SCR, and Expansion Project Development	608	563	163	79	41	0	0	0	0	0	1,454
	Red-Blue Connector		10	21	21	158	160	160	160	160	0	850
	Total	2,695	3,203	2,515	2,367	2,369	2,788	2,484	3,011	2,166	2,111	26,459

Starting with this 2021 Unconstrained 10-year Capital Investment Framework as a benchmark, which includes costs for the \$10 billion SGR Index from 2019, the task is to quantify the fiscal impacts of the revised \$24.5 billion figure. Put another way: how much new capital spending would be needed to manage the \$14.5 billion added to the updated SGR Index.

If the MBTA judged that \$1.4 billion in annual spending was necessary to manage what was a \$10 billion SGR backlog, it’s clear that adding \$14.5 billion to the SGR Index would require an increase in capital greater than another \$1.4 billion. Comparing the ratios of \$1.4 billion to \$10 billion SGR would suggest that the MBTA would need \$3.4 billion annually to manage \$24.5 billion SGR representing an increase of \$2 billion.

MTF’s own analysis, which integrates the SGR index, total asset values, remaining asset values and replacement costs of assets beyond their useful life, estimates that a capital investment of \$2.2 billion annually through FY 2036 is necessary to manage the additional \$14.5 billion SGR Index.

Given both approaches to estimating the need, it is reasonable to conclude that the revised SGR Index would necessitate an increased capital investment of approximately \$2 billion per year as a starting point.

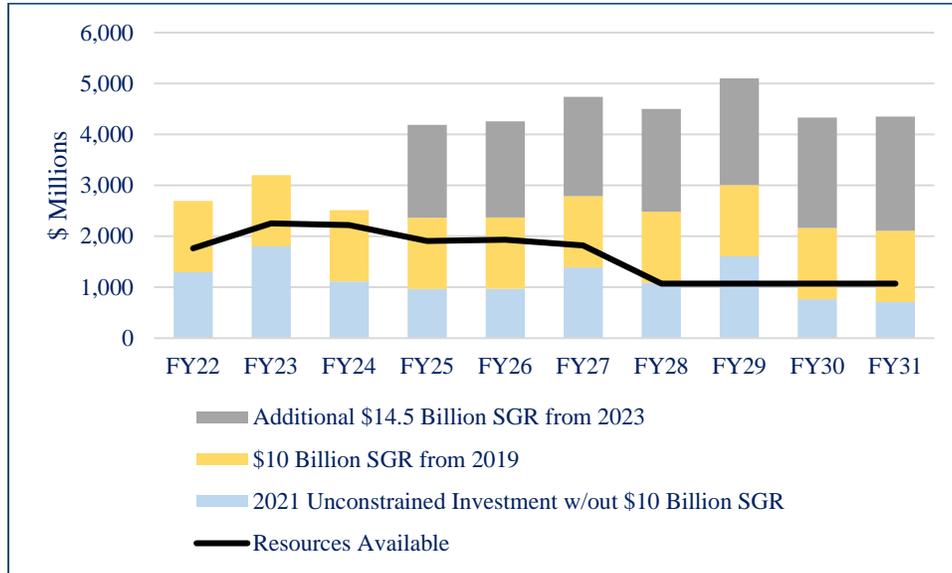
The implications are stark.

Given that the MBTA lacks sufficient resources to even manage the previous \$10 billion SGR Index, let alone the projects in the unconstrained 10-year spending framework, an additional \$2

⁶ Unconstrained 10-year Capital Investment Framework, Slide 6, Fiscal and Management Control Board, June 7, 2021.

billion in capital needs puts the capital gap at near unsurmountable levels (Figure 3), climbing to an average of \$3 billion annually for FY 2025 through FY 2031.

Figure 3 – What’s Needed – Capital Investments to Upgrade, Modernize, and Fix the MBTA



CAVEATS

As lawmakers and stakeholders await the MBTA’s release on the impacts of the \$24.5 billion SGR Index on capital investment needs, there are several matters that should be kept in mind:

- While the need is urgent, there is time for difficult debates about the future of the MBTA. As GM Phillip Eng said in a recent interview, the \$24.5 billion cost estimate, is “a snapshot in time of our assets,” not a statement of immediate need. “The idea is to be able to use this now to have those conversations on long-term funding and the ability to prioritize capital needs.”⁷
- Money isn’t the only problem – the MBTA has not exceeded \$2 billion in annual capital spend; the likelihood of doubling that in a highly competitive construction market in the near term is dubious.
- Workforce – should the MBTA achieve its hiring goals, the Authority will have flexibility to make improvements from operations that could reduce the amount of capital borrowing.
- The MBTA’s upcoming analysis will undoubtedly incorporate the lessons and efficiencies from their recently announced Track Improvement Program that could reduce capital requirements.

⁷ Eng says \$24 billion for MBTA is a ‘planning tool,’ not immediate need, Daniel Kool, The Boston Globe, November 19, 2023.

REALITIES & RECOMMENDATIONS: THE MBTA MUST RETHINK TRANSIT INVESTMENT DECISIONS

- Decades of underinvestment have resulted in a broken transit system that must now operate with two-thirds of its assets in need of repair or replacement.
- Given the additional capital needs, it's likely that the Commonwealth will fall short again.
- Given the resource gap, the MBTA must choose investment priorities and should start with a triage system that categorizes projects into immediate, urgent, and non-urgent groups.
- The MBTA should present these options, along with projected outcomes on performance and SGR, to the Board as part of its next five-year capital investment plan.
- Disruptions to transit services are unavoidable as access to and hours on the right-of-way dictate the time needed to fix the transit system.
- This work must also be cognizant of looming operating budget gaps that the MBTA projects could reach \$400 million - \$500 million as soon as FY 2026 ([here](#), Slide 4).
 - Failing to fund the MBTA's operating budget gap will render much of the debate about capital investments and improved service delivery moot.

Appendix A

Asset	SGR Index
Facilities	
Passenger & parking	3,000
Stations, terminals, stops	3,357
Rolling stock	2,382
Equipment	52
Structures	
Bridges, tunnels, viaducts	5,265
Signals	
Commuter Rail	1,310
Transit	753
Track	
Commuter Rail	1,235
Transit	2,037
Power	5,108
Total	24,499

Appendix B

Reliability/Asset Management	Address current asset condition and modernization needs by 2032
Accessibility	Improve accessibility at MBTA commuter rail, subway and bus stations. Investments are necessary to meet the goals of the Authority's Plan for Accessible Transit Infrastructure ("PATI")
Bridge and Tunnel	Reconstruct and replace MBTA commuter rail and transit bridges and tunnels system-wide
Bus and Bus Facility	Rehabilitate and replace the MBTA revenue fleet and rehabilitate and upgrade maintenance and administrative facilities that support MBTA operations
Power Program	Rehabilitate, replace and upgrade power assets across the commuter rail and transit system
Green Line Transformation	Improves the quality of service on the Green Line through fleet modernization and infrastructure/facilities upgrades, as well as improved capacity, accessibility and state-of-the-art technology.
RedLine/Orange Line Program	Includes the set of vehicle and infrastructure investments needed to fully modernize the fleet and achieve the service goal of 3 minute headways on the RL and 4.5 minute headways on the OL.
Rail Vision/Rail Transformation Phase 1	Incorporate options for improving service on the Commuter Rail, which are the first steps identified in a larger Commuter Rail transformation as outlined in Rail Vision.