



White Paper February 2020

On the MBTA Safety Review Panel Report



MBTA Red Line Derailment, June 2019. Photo: Boston Fire Department

Summary

A recent report by an independent safety review panel declared that the MBTA is at a critical point in its history. The Panel found the organization suffers from a deficient core focus on safety in combination with insufficient operating funds due to relentless budget cutbacks. The Panel commended recent efforts to increase the T's annual rate of capital investment, yet implored state and agency leadership to assess and better strike a balance between delivering that accelerated capital spend and maintaining legacy assets that contribute to the safety and reliability of the system for riders every day.

In this White Paper, A Better City offers brief thoughts on the Panel's work, organized around four main topics: (1) how leadership turnover and other cultural issues led to safety challenges at the MBTA; (2) how many factors, including relentless operating budget cutbacks, may have contributed to the T's major subway incidents of 2019; (3) how a needed focus on increased annual capital spend may have exacerbated the safety impacts of operating budget cutbacks; and (4) steps the MBTA should take to enhance its ability to safely deliver services.

Background

In response to the June 2019 Red Line Derailment,¹ the MBTA Fiscal and Management Control Board (FMCB) convened a Safety Review Panel (Panel) of national transport industry experts to take a comprehensive and

independent review of the T's safety performance, safety leadership and culture, and fiscal health. The Panel published its final report in December 2019.

Leadership Turnover and Cultural Issues

The Panel's December 2019 report received wide coverage in the local press. That coverage largely focused on the Panel's findings that the MBTA currently suffers from a number of 'cultural' challenges,² which include:

Excessive Leadership Turnover: Starting at the executive leadership level, since 2010 there have been nine new general managers (GMs). The Panel found this "has been incredibly disruptive and has placed the agency in a vulnerable position. This may be the overarching reason that we see the level of safety deficiency at the agency."³

Frequent FMCB and Executive Briefings: The FMCB is statutorily required to meet in session at least 36 times a year, a rate the Panel found excessive: "Staff preparation to meet the needs of the Board is overwhelming and leaves staff little if any time to tend to the operation or the maintenance of the system. It's unquestionable that this mandate is causing staff to "take their eye off the ball" and contributes to safety not getting the time and attention it requires."⁴

Organizational Fragmentation, Isolation and other Communication Challenges: In the conduct of its work, the Panel conducted nearly 100 separate interviews, ranging from a dozen staff each from the administrative, supervisory, and frontline (i.e. subway cab motor-person) ranks all the way up to members of the FMCB Board.

The Panel found the MBTA organization is overly fragmented with too many functional compartments: "Employees at all levels told the Panel that the T has many silos...."⁵

"Much of [our] discussion ... centered on silos and the lack of communication between leaders, managers, and the frontline."⁶ "Our objective was to hear the voice of those on the frontline. It became apparent ... that the absence of trust and respect, insufficient communications, an increased silo mentality resulting in poor teamwork, coupled with inadequately trained leaders are a core contributor to the T's poor safety performance and low morale."⁷

Relentless Operating Budget Cutbacks

The Panel remarked that many factors including relentless operating budget cutbacks may have likely contributed to the T's 2019 mainline subway incidents.

PMI & QA/QC Not Adequately Conducted: Public transit requires a considerable investment in vehicles, buildings, equipment, and machinery. Proper maintenance is the key to protecting public safety, managing public investments, and prolonging the useful life of capital assets. Preventative Maintenance and Inspection (PMI) requirements are a key tool used by agencies including the MBTA to ensure the physical integrity of vehicles and infrastructure.

With respect to the June 2019 Red Line derailment, the Panel focused on a key PMI requirement related to inspecting and performing proper maintenance to a so-called "grounding brush".

The grounding brushes are made of soft metallic material and must have a consistent and smooth connection to the turning axle. But in the case of Red Line Car that jumped the tracks in June 2019, the Panel determined that a grounding brush on an axle had worn down beyond acceptable limits. The flow of electricity between the brush and rotating axle became discontinuous and no longer smooth, resulting in intense electrical sparking that

led to a premature “fatigue fracture of the axle caused by a systemic failure of the axle grounding system”⁸ on Car #1602. Thus, the Red Line train derailed because electrical sparking caused an axle to weaken, fracture and break.

The Panel looked into why that grounding brush was able to wear down below acceptable limits. Under the relevant PMI, MBTA maintenance crews are required to visually inspect the ‘level markings’ on each Red Line axle ground brush, an act that can happen only after an environmentally sealed ‘ground brush housing cover’ is first unfastened and removed in order for the ground brush to be visually accessible. Such ‘housing covers’ protect against water or other debris from ruining critical yet sensitive componentry that lie inside.

The Panel concluded that this particular “PMI activit[y] had not been adequately conducted”⁹ and that the “equipment housing cover had not been removed, as required, to inspect internal components”.¹⁰ By not first removing the housing cover as required, MBTA field crews could not study the condition of the sensitive ground brush that resides inside.

Sound safety practices call for: (a) maintenance crews to properly fulfill all steps required of a given PMI; and (b) supervisory personnel to undertake inspection audits of such PMI work to help assure that field crews adequately perform work requirements, known as the QA/QC (Quality Assurance/Quality Control) function that provides oversight of maintenance practices, engineering, and implementation at the field level.

Considering the combination of required PMI’s and appropriate QA/QC oversight as two-halves of a proper safety system, the Panel concluded that: (1) “Critical PMI’s are not taking place as required”; and (2) “There is no meaningful QA/QC strategy or system in place at this point in time.”¹¹

The Panel then looked into why critical PMI’s are not being performed and the reasons behind lax supervisory auditing and oversight in the field.

Budget Cutbacks: Impacts to PMI’s and QA/QC Oversight: The Panel was unequivocal that the 2019 “Red Line and [other] accidents can be directly linked to systemic PMI deficiencies and lax QA/QC oversight”.¹² It appears the Panel felt that a root cause for these problems was budget cutbacks:

“Critical PMIs are not taking place as required. This creates a serious issue that requires immediate attention and this information has already been shared with MBTA leadership. Over the years, due to shortage of and/or inexperienced leadership, competing priorities and fiscal controls, operational managers have had difficulty identifying what maintenance and inspections need to be done, or have been dropped due to fiscal pressures or lack of staffing. Furthermore, there is little, or in many cases, no data to support what maintenance and inspections are required, or what has been accomplished.”¹³

“The Panel identified that a select portion of PMIs activities were intentionally no longer being performed on the transit side of the agency, which agency personnel attributed to human resource and track access challenges. It should be noted that the MBTA’s lack of hiring and succession planning has compounded the problem. As a result of these constraints, managers at the departmental level are placed in the untenable position of self-selecting what critical aspects of their PMI regimes will be performed and what PMIs will be deferred. This circumstance was elevated to senior managers; however, it was not sufficiently acted upon. The GM and FMCB appeared to be blind to this organizational risk until they were alerted to it by the Panel.”¹⁴

Budget Cutbacks: Operations Training Group & Safety: The Panel found that safety training is not the province of one part but rather housed in many different elements of the MBTA organization. The largest such safety training team lies within the Operations Department. The Panel determined that the this training group was hit hard by budget cuts previously imposed by executive leadership. Severe budget cuts that occurred in 2016 and 2017 “left the organization with a manpower shortage and a brain drain dilemma, with much of its industry/institutional knowledge walking out the door”¹⁵. ...[A recent] hiring freeze and reduction in headcount [w]as exacerbated by the most seasoned and knowledgeable employees accepting management sponsored ‘buy outs’ that resulted in significant brain drain. These talent issues have attributed to the MBTA’s poor safety culture.”¹⁶

In support of this finding, the Panel observed training classes formally run by two instructors now being done with just one. As a result, “critical information was often glossed over or not discussed at all. In the most glaring example, the instructor skipped over slides pertaining to the bus safety portion of training. Many of the individuals in attendance were contractors and it is unknown if they will be working in areas where bus safety training is relevant. In addition, the instructor wrote answers to the five questions regarding the bus safety curriculum on the chalkboard for the class to use on the final exam. This act improved the student’s odds of passing the course and receiving a ROW certification card.”¹⁷

The inability to properly staff required training courses is one thing. The Panel pointed to what it thought should be the simple act of how the T makes copies of safety training materials for handouts in training workshops. To its dismay, the Panel found that training handouts formerly printed in color by external vendors are now

printed in-house due to recent budget cuts: “As a result, staff has resorted to printing the manuals in black and white to cut down on expenses. This is problematic as there are a variety of different color flags needed to establish ROW protection; however, all of the different color flagging devices appear as black objects in the training manual. The current training manual has not been revised to adapt to this challenge, which could be done by labeling the flagging devices. These deficiencies are troubling.”¹⁸

Budget Cutbacks: Deferred Maintenance in Advance of New Fleets: The Panel also warned that recent MBTA budget cuts may have left the existing Orange Line fleet¹⁹ in an unacceptably low state of disrepair: “The...1979-81... fleet of ...[old] cars ... is scheduled to be retired by the commissioning of the ... new fleet [now being built]. Based on this schedule, it can be deducted, but not justified, that any significant work on the existing Orange Line cars has been deferred. The problem with this cost savings strategy is that often the new cars are either delivered late or even when delivered on time, they undergo an unstable phase characterized by infant mortality, software bugs, or design issues, all of which will delay their timely introduction into passenger service. Today the [Orange Line] cars show extensive car body corrosion, and in one instance, severe shelling of train wheel. Potential causative factors of wheel shelling are fatigue breakdown, poor track/roadbed conditions, excessive loads, rail adhesion issues due to propulsion and/or braking problems.”²⁰

Increased Capital Spend & Safety Issues

Some of the Panel’s most interesting observations of how budget cutbacks have likely cut too deep was in a discussion of the relationship between the MBTA’s operating budget and the intense and otherwise desirable goal to increase the annual capital spend coming out of the organization:

“Today, change at the T is occurring at an exciting and accelerated pace due to the leadership and support provided by the governor and the FMCB.”²¹ “A key priority of the FMCB has been acceleration of capital delivery to reduce the time span of bringing the system into a SOGR [State of Good Repair] with emphasis placed on increasing the capital spend rate.”²² “[T]he objectives [of] supporting Capital Delivery and fiscal control are the ones that have received the most focus and have been the priority of the [FMCB and executive leadership]. Delivery of the Capital budget has become the backbone of the strategic and tactical planning for the agency.”²³

But the Panel also points out what it found on the other side of the increased annual capital spend coin:

“However, it does not appear that the impact on Operations staff to support the [increased capital spend] has been fully contemplated⁴⁰.” “There has been significant focus on fiscal control to the detriment of the operating budget combined with a focus on increasing the throughput of capital delivery.”²⁴

This aspect of the Panel’s findings continues: “There is widespread concern that focusing predominantly on capital delivery is occurring at the expense of the operating needs. ...The acceleration of the [increased capital spend] will increase the reliance upon and utilization of Operations staff as it needs to draw assets from operating side, i.e. signals, power and flaggers to support its efforts. There will be no choice but to do it through flexing from daily maintenance or through overtime which could exacerbate safety related issues.... This circumstance places additional burdens on Operation’s staff, who feel that they are already underfunded to perform day-to-day tasks²⁵.”

Pay-Go Lockbox: “Double Whammy”

Since state fiscal year 2010 (SFY10), the Commonwealth of Massachusetts began to provide new additional monies to support MBTA operations. This additional financial assistance became available due to an increase in the state sales tax as part of new transportation finance legislation signed into law by Governor Patrick in 2009.

At first, this additional state assistance to the MBTA was used to help bring annual MBTA’s structural operating budget deficits into balance. But starting in 2014, new executive leadership changed the use of these new additional assistance monies. Rather than using these new funds provided by the state to bring the operating budget into balance, new MBTA leadership decided to deploy other measures to resolve the structural deficit without the need to tap into the additional assistance funds provided from the Commonwealth. These other measures used to reduce the budget deficit included several rounds of fare increases, increased privatization, and staffing and other cutbacks.

Because the MBTA had reduced or even eliminated the structural deficit beginning in 2016, MBTA leadership would then transfer the unused amount of the additional assistance monies into a so-called “Pay Go Lockbox” for reinvestment into the capital asset base of the system.

The Panel examined this accounting methodology and expressed a deep concern with how this new approach led to unwarranted increased challenges for the MBTA to properly maintain and safely operate its services:

“Pay Go Lockbox: The balance of funds transferred from operating savings. This presents a double whammy because operations is already underfunded, and any savings should be reinvested for those purposes. Examples of underfunding in

Operations are lack of budget for vegetation control and operator support ratio to cover service (in some instances supervisors are being used as a back-up to take trains out....)”²⁶

“Every operating dollar saved is [now to be] invested into the [increased annual capital spend]. That puts pressure on the operating budget. The FY19 budget overview indicated that FMCB targeted \$150M annual transfer of operating dollars to the [capital spend]. They stated that deficit spending deprives the [capital spend] of that funding. But it also deprives the operational resources necessary to perform daily maintenance.”²⁷

“There is a huge organizational focus on capital delivery and expansion. Expansion of the capital program only increases operating budget needs; increasing annually appropriated supplemental funds for capital sets up a conflict for Operations and increases the risks of not keeping legacy system assets in a state of good repair.”²⁸

Panel Recommendations

The Panel’s 34 recommendations contained 61 individual corrective actions, which can be grouped into six categories and summarized as follows:

Safety Policy: MBTA management must establish safety objectives, safety performance targets and safety performance indicators. Management must:

- Establish effective organization-wide QA/QC programs.
- Identify and correct all areas where deferred PMI’s (and actual maintenance) is not properly occurring.
- Provide direct mentoring and coaching to individuals in executive leadership and senior management roles.
- Should take measures to make meetings less burdensome on senior MBTA staff.

Safety Risk Management: The MBTA should:

- Restructure safety functionality across the organization so that it resides in one lead department.
- Evaluate and implement as appropriate, the findings of the third-party consultants that the Panel hired to conduct independent assessments of existing Track and Vehicle maintenance.
- Ensure that the appropriate level of resources are made available to correct any maintenance defects identified by these independent assessments.
- Continue to maintain rail cars to agency standards as long as the vehicles are used in passenger service.

Safety Assurance: The current culture of blame and retaliation at the MBTA’s transit operation is impeding the T’s ability to achieve a greater level of risk management, and leadership must:

- Actively encourage employees to report safety concerns.
- Promote existing and future employee safety reporting systems.

Safety Promotion: Current transit training functionality is decentralized which creates internal oversight issues, and leadership must:

- Evaluate centralized training to ensure that is consistent and of high caliber.
- Either resume printing color training manuals or update the current manuals to provide color coded labeling where applicable.

Safety Culture: There is a lack of clarity and alignment around safety leadership and MBTA must be intentional about the culture they want to establish and start by defining the organization’s vision, mission, values,

strategies and associated behaviors. MBTA must:

- Hold monthly Executive Safety meetings at the executive level and cascade information down through the organization.
- Create cross-functional teams with specific goals to achieve strategic plans and breakdown silos.
- Build and continuously update organization charts to help employees learn who, what and how the organization achieves its daily mission.
- Should invite the Panel back after a period of time has elapsed to gauge the progress of implementing these recommendations.

Finance and Budgeting Management:

Delivery of the Capital budget has become the backbone of the strategic and tactical planning for the agency, while insufficient attention is paid to day-to-day operations and maintaining the full functionality of legacy assets. FMCB must require MBTA leadership:

- Provide and publicly report on key performance indicators (KPIs) associated with PMIs and the performance of required maintenance of legacy system assets to keep them fully functional.
- Perform a zero-based budgeting (ZBB) analysis of each department to identify the appropriate level of resources needed to ensure the safe delivery of service and support core business functions.
- Avoid a top down approach to conducting the ZBB and have an inclusive dialogue with those directly impacted by these decisions.

Next Steps

Starting immediately upon publication of the Panel's report in December 2019, the FMCB has placed a Safety Update on its agenda for

each meeting. To date, the MBTA General Manager makes these presentations which discuss specific objectives, steps that need to be taken, and timelines for implementation.

In January 2020, Governor Baker's FY21 state budget recommendations proposed an increase of \$135 million in new support for the MBTA in order to help "deliver a safe, reliable, and effective transportation system...", funded in part by increasing the existing per-trip assessment for Transportation Network Company (TNC) rides to \$1.

A Better City will continue to monitor and report on steps taken to implement the Panel's recommendations.

¹ Other contemporaneous major subway incidents included the June 8, 2019 Green D-Line derailment near Kenmore Station and the August 23, 2019 Orange Line track fire near Wellington Station

² Two examples: "Safety 'is not the priority' at the MBTA, panel finds", Boston Globe, Matt Stout and Adam Vaccaro, December 9, 2019; and "Safety Culture lacking at the MBTA", Commonwealth Magazine, Bruce Mohl, December 9, 2019.

³ Safety Review Panel Report (Report), pp. unnumbered, ES-3.

⁴ Report, pp. unnumbered, ES-3.

⁵ SRP Report, pp. 35

⁶ SRP Report, pp. 35

⁷ SRP Report, pp. 33

⁸ See SRP Report, pp. 11

⁹ Note: the Panel did not publicly comment on how long such "inadequate PMI conduct" had been taking place going back in time, though it appears the duration was at least three-months in this case.

¹⁰ SRP Report, pp. 11

¹¹ SRP Report, pp. unnumbered (ES-2)

¹² SRP Report, pp. 8

¹³ SRP Report, pp. unnumbered (ES-2)

¹⁴ SRP Report, pp. 5

¹⁵ SRP Report, pp. 33

¹⁶ SRP Report, pp. 34

¹⁷ SRP Report, pp. 24

¹⁸ See SRP Report, pp. 24-25

¹⁹ For reasons unknown, the Panel did not include analogous commentary on the existing Red Line fleet that will similarly be replaced in its entirety by new cars now being built.

²⁰ SRP Report, pp. 12

²¹ SRP Report, pp. unnumbered (ES-3)

²² SRP Report, pp. 31

²³ SRP Report, pp. 29

²⁴ SRP Report, pp. 30

²⁵ SRP Report, pp. 31

²⁶ SRP Report, pp. 31

²⁷ SRP Report, pp. 32

²⁸ SRP Report, pp. 32