

# Safety Review Panel

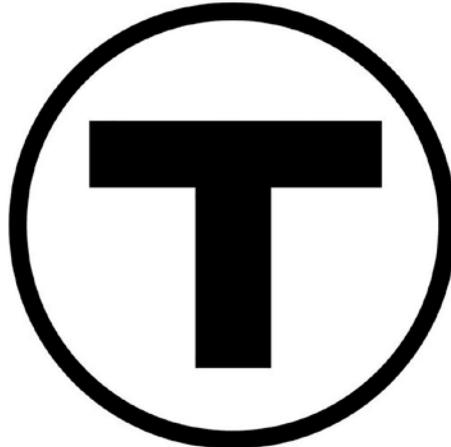


## Final Report

**December 9, 2019**

# SAFETY REVIEW PANEL

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**Ray LaHood**  
Safety Review Panel Member

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## Executive Summary

The Massachusetts Bay Transportation Authority (MBTA) or (T) experienced a series of high-profile mainline derailments and other rail related occurrences in recent years. These incidents resulted in numerous injuries, millions of dollars in equipment damage and repair costs, significant delays, unpredictable service, and increased dissatisfaction amongst regional stakeholders and customers regarding the organization's ability to provide safe and reliable service. In response, the MBTA Fiscal and Management Control Board (FMCB) convened a safety review panel (SRP) or (Panel) of external transportation industry experts to take a comprehensive review of the T's safety performance, safety leadership, and culture. The SRP's mission is to undertake a comprehensive, independent analysis of rail safety at the MBTA. This analysis includes a review of incidents over the past few years, as well as a broad analysis of the safety culture, policies, procedures, and practices at the MBTA. The SRP also compared the MBTA's practices to national and international best practices.

The SRP convened on June 27, 2019 and is comprised of Ray LaHood, a former United States (U.S.) Secretary of Transportation; Carolyn Flowers, a former Acting Federal Transit Administration (FTA) Administrator and Carmen Bianco, a former New York City Transit (NYCT) President (See Appendix "A" for biographies).

The Panel adopted the FTA's Safety Management System (SMS) as a framework for conducting its work. All mass transit properties throughout the U.S. must have a certified SMS in place by July 20, 2020 (See Appendix "B" for a brief description of the four components of SMS). Therefore, it was prudent to conduct this review within the framework of that new regulation. In essence,

*"SMS means a formal, top down, organization-wide approach to managing safety risk and assuring the effectiveness of the agency's safety risk mitigation. SMS includes systematic procedures, practices and policies for managing risks and hazards."*<sup>1</sup>

This Panel also evaluated the T's current safety culture and its leadership's approach to safety because an organization's ability to perform or conduct its business effectively is a product of its leadership and culture.

To complete this analysis: the SRP conducted over 100 collaborative discussions with FMCB members, senior staff, mid-level management, supervision, frontline employees, union leadership and representatives from FTA, Federal Railroad Administration (FRA), Department of Public Utilities (DPU), Keolis-the MBTA commuter agency contractor, LTK, HNTB, STV, CRRC and Network Rail to ensure a comprehensive effort was undertaken that takes advantage of the expertise that resides both within the agency and partner organizations; facilitated six (6) focus groups consisting of diverse groups of agency employees; and reviewed numerous MBTA policies, procedures, job descriptions and accident reports. Additionally, the Panel conducted site visits to

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<sup>1</sup> Federal Register, Department of Transportation, Federal Transit Administration 49 CFR Part 673, Public Transportation Agency Safety Plan, National Public Transportation Safety Plan; Availability; Proposed Rule and Notice, Section 673.5 Definitions.

the Operations Control Center (OCC), St. Mary's Station derailment site, Green line slow speed areas, Green Line Extension project (GLX) construction sites, rail vehicles maintenance facilities, i.e. Southampton Service and Inspection (S&I) Facility, Boston Engine Terminal, Cabot, Wellington, Orient Heights, Reservoir, Lake Street, Readville, Riverside, Mattapan, and Everett and participated in a live on-site derailment investigation at Reservoir Yard. Several Panel members also attended Right of Way (ROW) and Roadway Worker Protection (RWP) training. The Panel conducted head-car ride observations on portions of the commuter rail and mass transit systems. Lastly, the SRP requested that independent subject matter experts (SMEs) perform a detailed evaluation of the track maintenance and vehicle maintenance functions to ensure they are performing as intended.

Throughout the assessment phase, the Panel discovered that there are numerous factors that impact the T's safety protocols and its safety culture. The following narrative highlights many of the significant observations made by the SRP and their correlation to the SMS framework.

While the agency performs the necessary core functions to be considered a relatively safe system, many aspects of the T's approach to safety and operations need immediate attention. The Panel did identify omissions in the required Preventative Maintenance and Inspections' (PMIs) schedule and Quality Assurance/Quality Control (QA/QC) concerns that offer an explanation for many of the service disruptions that the MBTA is experiencing.

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. In other instances, procedures are well documented and available, but are not enforced by local supervision. It also does not appear that sufficient condition assessments have been conducted on many system assets that may drive a higher level of preventive maintenance actions. This will require leadership's urgent attention to identify what inspections and maintenance must take place, at what intervals, and establish performance indicators that show progress against stated goals.

Another component of sound safety management and a requirement of SMS is a QA/QC function that measures and provides oversight of maintenance practices, engineering designs and implementation at the field level. This function monitors the quality of the work being performed, and has independent individuals who conduct their work and brief leadership on their findings and recommendations. There is no meaningful QA/QC strategy or system in place at this point in time. This is another critical function that leadership must implement to establish a sound safety culture.

In general, the SRP found that the T's approach to safety is questionable, which results in safety culture concerns. In almost every area we examined, deficiencies in policies, application of safety standards or industry best practices, and accountability were apparent. The foundation for safety is also not obvious as the agency has not identified or adopted a comprehensive vision, mission, values or set of strategies and goals to guide the agency's actions to achieve a safe work

environment and to deliver quality service. Without such strategy being implemented and embraced by executive leadership, it becomes substantially more difficult for the agency to achieve the level of performance required to run a safe transit system.

It is noteworthy to mention that the commuter rail service is performing well and does not face many of the challenges that were identified on the transit side of the house. The Panel attributes this higher level of performance to the structure provided by FRA regulations, which are clearly defined and have fiscal consequences if not complied with. The one area that needs immediate attention is their fatigue management program, which does not contain an effective Obstructive Sleep Apnea (OSA) screening program; however, their management is diligently pursuing this goal. Conversely, the MBTA transit rail operation does have a mature fatigue program in place.

Leadership sets the tone for safety. Starting at the executive leadership level, the recurrent turnover in general managers (GMs) over the past 10 years 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. Since 2010, there have been nine new (9) general managers. The incumbent GM has only been in the position since January 2019. It is obvious that many new executives have been hired in recent years as the T attempts to position the agency to meet an aggressive capital initiative and the overall transformation of the agency. While it is excellent to build this team, little if any time has been invested to help them onboard, assimilate into the agency's mission, or to understand the agency's safety practices.

Also obvious is that the mandate requiring the FMCB to have such frequent meetings has had a detrimental effect on the organization. By legislation, this Board is required to meet in session 36 times a year. 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.

Our staff interviews and work in the field revealed that leadership feels somewhat defeated, helpless and in some cases hopeless. There is a general feeling that fiscal controls over the years may have gone too far, which coupled with staff cutting has resulted in the inability to accomplish required maintenance and inspections, or has hampered work keeping legacy system assets fully functional. Staff repeatedly shared their frustration with the cost-cutting process and the inability to acquire new positions as needed to accomplish the task at hand. It is our understanding that in recent months, leadership has instituted new standards for the approval of staff positions that will provide a quicker turnaround.

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. The desire to invest in the infrastructure and operation, the expansion of new services and hiring of many new employees has resulted in sweeping changes. However, there is no question, current leadership is struggling to understand how they will deliver the accelerated Capital Program, keep legacy system assets fully functional, in addition to carrying out normal day-to-day PMIs, given the current state of the Authority.

The FMCB developed a strategic plan to set the direction, initiatives, and programs to drive the outcomes and inform the decision-making process of the agency. However, the cultural environment at MBTA is narrowly focused on values, attitudes and behaviors, which are centered around the delivery of the capital plan. Although the plan stipulates that safety is a priority, the reality is that on a tactical level, the priorities and resources of the agency have been dedicated to capital acceleration. The FMCB has put a significant focus on fiscal control of operating expenses, while at the same time increasing the throughput of the capital program. The outcome of this emphasis on capital delivery has been detrimental to Operations. The result is sharing of critical operational resources and stretching those resources to serve multiple functions. For example, the maintenance crews are being flexed between daily operational support requirements and the accelerated capital program. This has had an adverse impact on the ability to support system maintenance repairs and safe delivery of services.

The strategic plan is crucial to provide guidance and direct decision making at the agency. Goals and objectives for the agency were developed to respond to the financial and capital delivery crises. But the strategic plan, as well as, the annual financial plan lacks a critical element — there is an absence of measures or metrics for monitoring, evaluating, and analyzing outcomes of the Board's priorities. This is particularly evident in the monthly safety reports which basically provide a trend line but no target comparisons. There are also no metrics for key operational indicators, such as PMIs that contribute to the safety of the system. Asset management and life cycle maintenance are key to keeping the system fully functioning but MBTA is not monitoring the performance of their maintenance programs.

The Safety Department plays a critical role in establishing a successful SMS program. Currently, from a safety perspective, leadership across the agency is not connected to any identified safety values or goals, at any level, including the GM, Deputy GM or senior operating staff. The safety department, which should be providing day-to day leadership for safety initiatives, is somewhat debilitated in what they can accomplish, and lacks the ability to guide the agency at large. For example, the staff is absent in the field to support the workforce and champion a safe work environment. On the other hand, the safety department is grossly understaffed, lacks subject matter experts (SMEs) and is currently not in any position to manage the needs of the agency. It is also important to note that the head of the safety department is new and started in that position in January 2019.

The Panel also found that a current culture of blame and retaliation impede the T's ability to achieve a greater level of risk management and safety assurance. Perceived or real, employees in general do not trust their leadership and therefore, do not share with leadership what is happening in the field for fear of heavy-handed discipline. The workforce does not feel supported by management and are clearly frustrated with the management's lack of responsiveness to their needs. We heard countless situations where employees' requests for needed safety equipment or support went unanswered. During this review, we also heard and gained first-hand knowledge of circumstances where employees, who reported safety issues on numerous occasions eventually lost faith in management's ability to care about getting anything done. As a result, it is likely that many safety issues today go unreported.

The lack of upward and downward communication within the agency is also at the core of many of the T's safety issues. As mentioned earlier, employees lack trust in their leadership or fear retribution so they generally refrain from reporting issues or identifying themselves in any reports. But even beyond this issue, there is a total lack of routine upward or downward communication within the agency. Employees at all levels told the Panel that the T has many siloes and that communication is rarely, if ever, done across departments. Leadership has not identified or attempted to open channels of communication with the workforce. An overwhelming number of employees are not able to receive electronic communications and have minimal alternatives to communicate with agency leaders, nor do leaders have a way to communicate with the workforce. The only avenue for communication we identified during this review is a "safety hotline" which does not appear to have received the confidence of the workforce in the field. It should be noted that the Panel met staff in support functions, such as internal communications and human resources, who have the skills and abilities to implement new strategies that will improve communications to build trust among all levels of employees.

In essence, safety is not the priority at the T, but it must be. To meet the demands of the future, the agency must address its safety culture – it is critical to every aspect of the agency. The GM must make safety his number one priority and realize there is nothing more important to the T's customers and employees than safety. This should also be the number one priority in quality maintenance and inspections, employee training and communication, staff onboarding, values, goals and strategy. The GM must clearly identify every leader's role in making safety the number one agency priority. It is critical that every department and leader within the agency is clear on his or her safety responsibilities. Not only should such responsibilities be a detailed part of every employee's job description, but all employees should receive ongoing feedback to create accountability. Having safety as a core value will drive strategy and decision making in the future.

The SRP is providing 34 recommendations, which contain 61 individual corrective actions that the Panel believes will set the agency on the path toward implementing a more effective SMS approach to safety and decrease the frequency and severity of organizational accidents.

In conclusion, the SRP wants to acknowledge and thank the members of the FMCB and especially the Chair, who provided exemplary leadership and unlimited support to make this review achieve its stated mission. We would also like to thank the staff, employees and numerous labor leaders, who have helped us gather the information found in this report, as well as the FTA, FRA, DPU, Keolis, LTK, HNTB, STV, CRRC and Network Rail for their input and collaboration throughout the process.

The Panel wishes the T great success in the future and hopes this report helps achieve safety success and full compliance with SMS.

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## **I. ACRONYMS**

|                   |  |
|-------------------|--|
| AFC               | Automated Fare Collection  |
| BTS               | Bureau of Transportation Statistics                                |
| C <sup>3</sup> RS | Confidential Close Call Reporting System                           |
| CAP               | Corrective Action Plan   |
| CIP               | Capital Improvement Plan   |
| CIPSEA            | Confidential Information Protection and Statistical Efficiency Act |
| DPU               | Department of Public Utilities                                     |
| FMCB              | Fiscal Management and Control Board                                |
| FRA               | Federal Railroad Administration                                    |
| FRMP              | Fatigue Risk Management Program                                    |
| FTA               | Federal Transit Administration                                     |
| GLX               | Green Line Extension Project                                       |
| GM                | General Manager  |
| GPS               | Global Positioning System  |
| KPI               | Key Performance Indicator  |
| LIDAR             | Light Detection and Ranging Technology                             |
| MASSDOT           | Massachusetts Department of Transportation                         |
| M&E               | Mechanical & Engineering   |
| MBTA (or T)       | Massachusetts Bay Transportation Authority                         |
| MOW               | Maintenance of Way   |
| NASA              | National Aeronautics and Space Administration                      |
| NYCT              | New York City Transit  |
| NTSB              | National Transportation Safety Board                               |
| OCC               | Operations Control Center  |
| OSA               | Obstructive Sleep Apnea  |
| POD               | Point of Derailment  |
| PPE               | Personal Protective Equipment                                      |
| PTASP             | Public Transportation Agency Safety Plan                           |
| QA                | Quality Assurance  |
| QC                | Quality Control  |
| ROW               | Right of Way   |
| RTA               | Rail Transit Agency  |
| RWP               | Roadway Worker Protection  |
| SME               | Subject Matter Expert  |
| SMRC              | Safety Management Executive Review Committee                       |
| SMS               | Safety Management System   |
| SOGR              | State of Good Repair   |
| SRCP              | Safety Rules Compliance Program                                    |
| SRP (or Panel)    | Safety Review Panel  |
| SSOA              | State Safety Oversight Agency                                      |
| TAM               | Transit Asset Management   |
| U.S.              | United States  |
| WMATA             | Washington Metropolitan Area Transit Authority                     |
| ZBB               | Zero Based Budgeting   |

## **II. BACKGROUND**

The FMCB was established by Governor Charles Baker and the Legislature in July 2015 to oversee and improve the finances, management, and operations at the MBTA. In the spring of 2016, the FMCB initiated a strategic planning process to clearly articulate priority initiatives to reinvent the MBTA as a 21<sup>st</sup> century organization. If executed well, the plan is intended to ensure that there is never again a deterioration of the public transit system, and instead, that they are supported and held accountable to continuously improve the vital service that the T provides.<sup>2</sup>

In recent years, the MBTA has experienced a series of high-profile mainline derailments and other rail related operational incidents. These events resulted in numerous injuries, millions of dollars in equipment damage and repair costs, significant delays, unpredictable service and increased dissatisfaction amongst regional stakeholders and customers regarding the organization's ability to provide safe and reliable service.

In response to these events, and aligned with the continuous improvement aspect of the strategic plan, the FMCB convened a SRP of external transportation industry experts to perform a detailed review of the T's safety performance, safety leadership, and culture. The mission of the SRP is to undertake a comprehensive, independent analysis of rail safety at the MBTA. This analysis includes a review of incidents over the past few years, as well as a broad analysis of the safety culture, policies, procedures, and practices. In addition, the SRP conducted a comparison of the T to national and international best practices.

To complete this analysis: the SRP conducted over 100 collaborative discussions (see Appendix C for "List of Interviewees") with FMCB members, senior staff, mid-level management, supervision, frontline employees, union leadership and representatives from FTA, FRA, DPU, Keolis-the MBTA commuter agency contractor, LTK, HNTB, STV, CRRC and Network Rail to ensure a comprehensive effort was undertaken that takes advantage of the expertise that resides both within the agency and partner organizations; facilitated six (6) focus groups consisting of diverse groups of agency employees; and reviewed numerous MBTA policies, procedures, job descriptions and accident reports.

Additionally, the Panel conducted site visits to the OCC, St. Mary's Station derailment site, Green line slow speed areas, GLX construction sites, rail vehicles maintenance facilities, i.e. Southampton S&I Facility, Boston Engine Terminal, Cabot, Wellington, Orient Heights, Reservoir, Lake Street, Readville, Riverside, Mattapan, and Everett and participated in a live on-site derailment investigation at Reservoir Yard. Several Panel members also attended ROW and RWP trainings. The Panel conducted head-car ride observations on portions of the commuter rail and mass transit systems. Lastly, the SRP requested that independent SMEs perform a detailed evaluation of the track maintenance and vehicle maintenance functions to ensure they are performing as intended.

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<sup>2</sup> MBTA Fiscal and Management Control Board, Strategic Plan, April 2017.

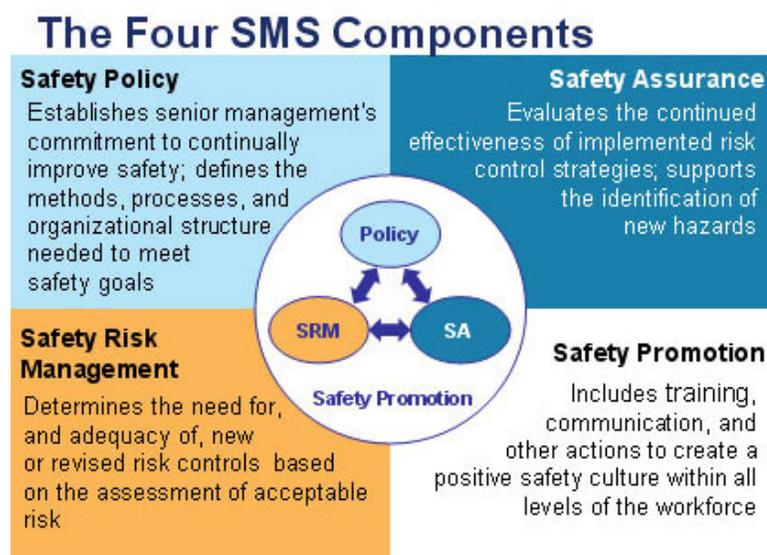
### III. INTRODUCTION

The Panel adopted SMS as the framework for conducting its work, as all mass transit properties throughout the U.S. must have a certified written SMS policy in place by July 20, 2020. In essence:

*“SMS means a formal, top down, organization-wide approach to managing safety risk and assuring the effectiveness of the agency’s safety risk mitigation. SMS includes systematic procedures, practices and policies for managing risks and hazards.”*

FTA’s adoption of the SMS framework elevated the approach to safety in public transit, shifting the industry from a reactive one to a more proactive stance with greater focus on the prevention of events. SMS is intended to bring management and labor together to build a safety culture in transit dedicated to controlling and reducing risk, detecting and correcting safety issues in their early stages. The SMS framework is comprised of four (4) key components; Safety Policy, Safety Risk Management, Safety Assurance and Safety Promotion.

Figure 1: The Four SMS Components



For the clarity of the reader, the report will be making distinctions between the MBTA’s commuter rail operation and their transit rail operation. The day-to-day commuter rail operation is outsourced to Keolis and falls under FRA oversight. Their management interfaces with key MBTA personnel, who oversee Keolis’ contractual obligations. The transit side of the house is solely managed by MBTA personnel and falls under DPU oversight, which is the MBTA’s State Safety Oversight Agency (SSOA). The DPU is subordinate to the FTA.

In general, the SRP found that the T’s approach to safety is questionable, which results in safety culture concerns. In almost every area we examined, deficiencies in policies, application of safety standards or industry best practices, and accountability were apparent. The foundation for

safety is also not obvious as the agency has not identified or adopted a comprehensive vision, mission, values or set of strategies and goals to guide the organization's actions to achieve a safe work environment and deliver quality service. Without that being in place and embraced by executive leadership, it becomes substantially more difficult for the agency to achieve the expected level of performance that is required to run a safe transit system.

Throughout the assessment phase, the Panel discovered that there are numerous factors that impact the T's safety protocols and its safety culture. These are clear signs that the current SMS and the agency's overall approach to safety is not functioning properly. In essence, safety is not the priority at the T, but it must be. To meet the demands of the future, the agency must address its safety culture – it is critical to every aspect of the agency. The GM must make safety his number one priority and realize there is nothing more important to the T's customers and employees than safety. This should also be the number one priority in quality maintenance and inspections, employee training and communication, staff onboarding, values, goals and strategy. The GM must clearly identify every leader's role in making safety the number one agency priority. It is critical that every department and leader within the agency is clear on his or her safety responsibilities. Not only should such responsibilities be a detailed part of every employee's job description, but all employees should receive ongoing feedback to create accountability. Having safety as a core value will drive strategy and decision making in the future. The following narrative highlights many of the key observations made by the SRP and their correlation to the SMS framework.

#### **IV. SAFETY POLICY**

##### **Safety Objectives and Performance Targets**

As part of the Safety Policy component of SMS, transit agencies must establish its organizational accountabilities and responsibilities and have a written statement of safety management policy that includes the agency's safety objectives and safety performance targets.<sup>3</sup> Therefore, a significant factor in a successful SMS is sharing and analyzing safety data to help establish these metrics. Once established, they must be formally communicated throughout the agency (as appropriate), reviewed to measure the effectiveness of risk mitigations and periodically updated to ensure the organization is achieving the intended outcomes. Furthermore, data analysis aids senior leadership in making risk-informed decisions to more effectively prioritize organizational actions and the allocation of resources, as well as developing and implementing corrective action plans (CAPs) to address safety concerns.

There is a serious challenge within the agency related to collecting and analyzing data. This leads to inadequate data to develop, implement, measure and monitor progress towards strategic objectives. In discussions with MBTA staff, the organization appears to be in the process

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<sup>3</sup>There are 3 key terms for establishing performance measurement criteria:

Safety Objective - A high level, global, generic and non-quantifiable statement regarding conceptual safety achievements to be accomplished by an organization regarding its safety performance.

Safety Performance Target – A specific level of performance for a given performance measure over a specified timeframe related to safety management activities.

Safety Performance Indicator – A data-driven, quantifiable parameter used for monitoring and assessing safety performance.

of implementing electronic means of tracking critical records; however, this effort shows great variation depending upon which department is engaged in the conversation. The Vehicle department appears to be the most advanced in this effort, while many of the Maintenance of Way (MOW) departments, i.e. Track, Signals, Power, are in their infancy.

The SRP found little evidence of the MBTA's mass transit operation establishing safety objectives, safety performance targets or safety performance indicators. Very few measures have been established to monitor safety as well as other key operational indicators. The monthly Safety reports have only one metric, "zero derailments". There are no targets or key performance indicators for other operational incidents such as collisions, fires, employee lost time injury rates and preventative maintenance, as some examples. The agency does not use performance monitoring tools such as dashboards, balanced scorecard, strategy maps or industry benchmarking to set targets or track performance. Most of the reports can be characterized as record keeping, providing month to month trends with no analysis and causes for variance in the data reported.

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 SRP.

Essentially, deferred maintenance has been institutionalized in some areas of the organization. Without established safety performance targets and indicators in place, there is no mechanism to alert executive leadership of this shortcoming. Nor were these deficiencies flagged by the Safety department during Safety Assurance activities, which will be discussed later in the report.

In addition, there is little, or in many cases, no data to support what maintenance and inspections are required, or what has been accomplished. In other instances, procedures are well documented and available, but are not enforced by local supervision. Nor does it appear that sufficient condition assessments have been conducted on legacy system assets that may drive a higher level of preventive maintenance actions; the condition of the Orange Line vehicles is one example, which will be discussed further in the Safety Risk Management section of this report. In response to these findings, transit management is having a consultant evaluate PMI and QA/QC activities so that the agency can develop strategies to address this situation.

It is noteworthy to mention that the commuter rail service operated by Keolis is performing well and does not face many of the challenges that were identified on the transit side of the house. The Panel attributes this higher level of performance to the structure provided by FRA regulations, which are clearly defined and have fiscal consequences, if not complied with. The MBTA should seriously consider immediately adopting FRA regulations for the transit operation to provide clear direction to the workforce on minimum thresholds for operational safety activities. These thresholds can be modified once the agency is better organized and is running well.

Perhaps of greater significance, Keolis and MBTA management assigned to oversee the commuter rail contract, appear to be fully engaged in the daily operations of the organization, while the leadership on the mass transit side of the house, appears to be extremely distracted by preparing for frequent FMCB meetings. This dynamic is clearly affecting the operational and safety performance of the organization.

### Safety Reporting Systems

SMS Safety Policy requires Rail Transit Agencies (RTAs) to establish a process that allows and provides protection to employees who report safety conditions, and provides a description of behaviors that may result in disciplinary action. Close call or safety reporting systems have proved to be an effective method for improving safety in the chemical, nuclear and transportation industries. A non-punitive, confidential close call reporting system typically uses a collaborative problem-solving methodology that encompasses all stakeholders. Success of such a program requires a focus on precursor events that may lead to accidents, the use of data and SMEs to determine corrective actions.

The main avenue for employees to report safety issues, on the transit side of the house, is a “safety hotline,” which appears not to have the confidence of the workforce in the field. There are other methods of reporting i.e. Good Faith Challenge forms, reporting safety concerns directly to supervision or to a Safety officer, etc.; however, these methods do not appear to be used in any meaningful way.

Safety department representatives have made efforts to promote the safety hotline, and it has recently experienced an increase in the volume of calls being received. The SRP believes that greater reporting of safety concerns does not necessarily translate into an increase in safety issues. On the contrary, the SRP views increased reporting as a positive trend that can surface safety concerns and should be measured over time to see if it is sustained. Further details of the MBTA’s employee reporting systems and the agency’s present culture of blame and retaliation will be discussed in the Safety Assurance section of this document.

### Communication

Another requirement of SMS is for the safety management policy to be communicated throughout the agency. The lack of communications is also at the core of many of the Ts safety issues. As mentioned earlier, employees lack trust in their leadership or fear retribution so they generally refrain from reporting issues or identifying themselves in any reports. But even beyond this issue is a total lack of routine upward or downward communication within the agency. Employees at all levels told the Panel that the T has many siloes and that communication is rarely, if ever, done across departments.

Leadership hasn’t identified or attempted to open channels of communication with the workforce. An overwhelming number of employees are not able to receive electronic communications and have minimal alternatives to communicate with agency leaders, nor do leaders have a way to communicate with the workforce. It should be noted that the Panel met

support staff, such as internal communications and human resources personnel, who have the skills and abilities to implement new strategies that will improve communications and begin to build trust among all levels of employees. These resources appear to be under-utilized at the present time. The GM and Deputy GM have also started to engage field personnel to solicit their feedback on the safety challenges facing the organization.

### Accountable Executive

SMS requires that the RTA identify an “Accountable Executive” to be accountable for ensuring that the agency’s SMS is effectively implemented. This individual is typically the head of the organization, i.e. the GM in the case of the MBTA. This individual is also responsible for addressing substandard SMS performance. The Accountable Executive may delegate specific responsibilities; however, he/she is ultimately accountable for the agency’s safety performance.

Leadership sets the tone for safety, starting at the executive leadership level. The recurrent turnover in GMs over the past 10 years 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. Since 2010, there have been nine (9) new GMs. The incumbent GM has only been in the position since January 2019. This individual does not possess in-depth transportation operations and safety knowledge, which are the core functions of the organization that he is tasked with managing. Additionally, members of the existing leadership team have not achieved the results that the riding public expects of the T; therefore, these executive leaders should receive mentoring and coaching by seasoned transit industry professionals to improve their effectiveness.

It is also obvious that many new executives have been hired in recent years, as the T attempts to position the agency to meet an aggressive capital initiative and the overall transformation of the agency. While it is excellent to build this team, little if any time has been invested to help them onboard or assimilate them into the agency’s mission or understand its safety practices. In addition, the senior leadership team should be augmented with seasoned transit professionals with operations and safety backgrounds, as previous employee reductions because of force incentives or “buy-outs” has created organizational brain drain in many areas. Metaphorically, the T does not have a deep bench of seasoned leadership in both the technical and support areas.

The FMCB would also benefit from adding individuals with operations and safety skillsets to its ranks to provide a more holistic approach to overseeing the MBTA. At current, the Board does not have anyone who has operational or safety experience or expertise. Nor is the FMCB chartered in its mission as a Board to specifically monitor safety or safe operations; therefore, over its existence, the FMCB has done little to make safety a priority or to hold leadership accountable for safety performance. The Boards of other transit agencies have done a much better job to identify members who possess these skill sets, i.e. a sitting FRA Chief Safety Officer and a retired Vice Chairman of the National Transportation Safety Board (NTSB), as some examples. The FMCB should consider a similar approach to ensure safety receives adequate attention.

## **V. SAFETY RISK MANAGEMENT**

## Hazard Mitigation

Safety Risk Management requires the agency to develop processes for the identification, analysis and evaluation of potential consequences associated with safety hazards. Safety risk must also be evaluated in the terms of probability and severity, as well take into account existing mitigations already in place. Once the evaluation is complete, the agency must develop and implement mitigations, i.e. CAPs.

The CAPs being produced by MBTA transit management are not achieving the level of safety improvement needed at the organization. Over a seventy-six-day period, there were three major incidents (June 8, 2019, Green Line Overspeed derailment, the June 11, 2019, Red Line broken axle derailment and the August 23, 2019, Orange Line track fire). These events resulted in 13 injuries, and millions of dollars in damage, repair and labor costs.

MBTA management provided the SRP with estimates of the costs associated with the Red Line derailment – this exceeded five million dollars. Based upon our professional experience, the SRP believes that this cost estimate is extremely under-representative of the true financial impact to the agency when considering all aspects of the event. The recovery required the rehabilitation of the damaged signal room, the installation of approximately 20 miles of new signal cables and other signal equipment, the operational testing of new signal relays and operational field testing of signal circuits. There was also track and rail vehicle damage, as well as the costs associated with consultant analysis fees, the labor associated with the fleet-wide ultrasound testing of axles and the inspection of ground brush assemblies. There are other costs, such as a loss of customer revenue, that did not appear in the cost estimates.

This incident also initially required a bus bridge operation, which was closely followed by a manual block operation to provide train service. The manual block required the support of 50 employees a day for approximately 106 days. Of much greater significance than fiscal implications associated with these activities is that this single event exposed the agency to a tremendous amount of organizational risk. A complex manual train operation performed without the protection provided by a functioning signal system is very susceptible to human error. However, MBTA transit management ensured sufficient supervision and Safety personnel were present to oversee the daily operation, which was ultimately carried out safely.

The Red Line and Orange Line incidents can be directly linked to systemic PMI deficiencies and lax QA/QC oversight. These activities are fundamental tasks that all rail agencies perform; however, previous accident investigations did not surface these deficiencies. As a result of ineffective investigations, the needed evaluation of the risk associated with these hazards was not performed. Subsequently, the CAPs to combat these safety concerns were never created; therefore, the organization continues to experience repetitive operational incidents.

## Corrective Action Plans

The Green Line is vulnerable to human performance errors resulting in operational incidents, which is primarily due to the limitations of its current signal system. The signal system

on the Green Line is scheduled to be upgraded, which will dramatically reduce human performance errors. However, until that occurs, the MBTA has developed CAPs to address this circumstance.

Presently, the MBTA transit management CAP process is as follows; once a hazard is identified, the DPU and MBTA's transit management teams work collaboratively in the development, implementation and closure of CAPs. As one example, in response to the June 8, 2019, overspeed derailment at Kenmore Square, the MBTA implemented CAP 4624-4. This CAP pertains to MBTA staff performing Light Detection and Ranging (LIDAR) speed checks on the Green Line. It states, "LIDAR testing will be conducted at a minimum of twice weekly and the results will be reviewed and analyzed at standing meetings to identify emerging trends." This is one of four actions that need to be completed to close the overall CAP. The other corrective actions focus on improved training (Open), developing automation of Global Positioning System (GPS) tracking on Type 8 trolleys to identify and alert management of speed infractions (Open), and a pilot of a "Green Line Location Map" that enables OCC dispatchers to manually click on icons representing Green Line trains to determine their speed in real time (Closed).

In June and July of 2019, more than 1,100 Safety Rules Compliance Program (SRCP) audit activities were conducted on the Green Line and in June, there was a 300% increase in the frequency of safety audits when compared to the previous month. These activities are commendable; however, it appears that transit Operations and Safety management are responding to lagging indicators, i.e. reacting to incidents that have already transpired. In discussions with the Safety department, the SRP was informed that their personnel are predominantly present on the 8-4 tour and do not have a significant presence on other tours. However, they do have personnel on-call to respond to events that occur during other tours. Therefore, the Safety department is largely focused on responding to events, rather than the prevention of accidents. In addition, proactive maintenance activities such as vegetation control had been suspended by Operation's management. This circumstance will be discussed in the more detail in the Safety Assurance section.

In addition, CAP 4624-4 focuses solely on over-speeding on the Green line. There does not appear to be an organization-wide strategy to perform these actions on other rail lines or to measure other types of non-conformance to rules beyond over-speeding. Nor is there a clearly articulated plan to perform operational tests or inspections beyond the title of "motor-person".

CAP 4624-4 was "opened" by the MBTA on July 9, 2019 and it was subsequently submitted to the DPU and approved to be "closed" approximately one month later on August 9, 2019. The rapid closure of this corrective action does not provide sufficient time for staff to monitor that these activities are being repetitively performed and to verify whether or not it is having the desired effect. In addition, although the CAP states in part, "...the results (of LIDAR testing) will be reviewed and analyzed at standing meetings to identify emerging trends." The SRP is not aware that there was a detailed analysis of the original 1,100 audits that were conducted. A detailed analysis of this data may drive further actions. In addition, it is human nature for individuals to focus on open items and lose sight of "closed" actions. Therefore, the Panel is not confident that continued analysis and verification activities will be sufficiently conducted.

The above example is illustrative of the MBTA transit management's current approach to safety: Following an incident, there is a feverish response to a very specific problem without developing and implementing a global strategy to address the hazard. The corrective action is tracked for a brief duration and then closed. The CAPs are not being effectively audited to evaluate whether the required actions are continuing to take place or if the corrective action is effective. As a result, no substantial corrective actions are institutionalized, which if nourished, could create permanent change. Hence, the safety concerns and operational incidents persist.

Conversely, on the commuter rail side, Keolis has clearly defined targets and upon request, their management was able to produce detailed data regarding the amount of operational testing and inspections<sup>4</sup> that are being performed by the type of test, title of the person being monitored and the outcomes. It should be noted that the DPU has performed independent LIDAR checks to monitor over-speeding by motor-persons; however, the FRA appears to have a more robust program as their inspectors routinely perform observations of multiple areas, i.e. transportation, track, signals, RWP activities, etc. to gauge the organization's performance.

Of much greater significance, on the commuter rail side, there are mechanisms in place to identify and act upon non-conformance should it occur. FRA personnel reviewed the Keolis' operational test and inspection data<sup>5</sup> and noted that some of the required activities were not meeting established agency goals. When this information was brought to senior Keolis and MBTA management's attention, they jointly reviewed the situation and increased the number of "Route Line Manager" positions to bring operational testing and inspection levels back into conformance. This is a much more proactive approach to safety than is seen at MBTA's transit operation. At Keolis, the FRA oversight personnel identified a potential hazard and contractor/agency personnel implemented risk mitigation strategies to address it *before* a significant event occurred. This circumstance presents a benchmarking opportunity for the MBTA's transit management, i.e. they can compare best practices utilized on commuter rail and consider adopting the same approach, where it makes sense for their operation.

The FRA regulatory requirement to conduct these tests and inspections gives Keolis and MBTA management, who oversee the contract, great leverage to seek and receive resources for these activities. This leverage is not as apparent on the transit side of the house, as they are not subject to such defined regulations. Nor has their management established targets for a broad range of operational tests and inspections, which could be used to make a business case for funding these activities.

It should be noted, that MBTA transit management does have an excellent employee fatigue risk management program (FRMP); however, transit management should evaluate requiring contractors, who perform safety sensitive operations such as operating work equipment, to also comply with the T's FRMP standards. This is also one area where Keolis needs to improve,

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<sup>4</sup> 49 CFR Part 217.9-Program of operational tests and inspections; "recordkeeping (a) Requirement to conduct operational tests and inspections. Each railroad to which this part applies shall periodically conduct operational tests and inspections to determine the extent of compliance with its code of operating rules, timetables and timetable special instructions..."

<sup>5</sup> 49 CFR Part 217.9 Program of operational tests and inspections; recordkeeping (d)(2) Each railroad shall retain one copy of its current program for periodic performance of the operational tests and inspections...These records shall be available to representatives of the FRA for inspection and copying during normal business hours.

as they currently lack an Obstructive Sleep Apnea (OSA) screening program. Implementing a program of this nature is a proactive measure that exceeds current FRA regulatory obligations and is another action that can further reduce human performance errors from occurring. Several commuter rail properties and transit agencies have voluntarily implemented programs of this nature and they can be used as a resource by Keolis for benchmarking. Keolis and MBTA management is diligently working toward implementing an OSA screening program on commuter rail.

### Subject Matter Expert Inspections

As stated earlier, the CAPs being produced by MBTA management are not achieving the level of safety improvement needed at the organization. Some of the recent high-profile derailments on both the commuter rail and mass transit side of the MBTA operation appear to have rail vehicle related defects as causal factors. In addition, there were also track defect related derailments on the transit side of the operation. Based upon the circumstances of these events and other operational incidents, the SRP had concerns pertaining to the lack of CAPs focused on PMI and QA/QC activities; therefore, we recommended a “boots on the ground” detailed inspections of the Track and Vehicle maintenance areas from third party consultants with the appropriate subject matter expertise to aid in identifying safety hazards.

The independent SME, who performed the vehicle maintenance evaluation, grouped his key findings of the transit operation into the following eight categories: (1) non-compliance to PMIs; (2) poor condition of Orange Line fleet; (3) unsatisfactory QA/QC activities; (4) unsatisfactory conditions at maintenance facilities; (5) low level of urgency following a safety related incident; (6) Reliability Centered Maintenance program only partially implemented; (7) insufficient management Dashboard/Key Performance Indicators (KPIs); and (8) industrial safety deficiencies. The following narrative highlights some, but not all, of the safety concerns identified by the rail vehicle SME.

The SME found indications that vehicle PMI activities had not been adequately conducted, as one example, an equipment housing cover had not been removed, as required, to inspect internal components. With regard to the key finding pertaining to “low level of urgency following a major safety related incident”, the SME reported that following the June 11, 2019 Red Line derailment, the root cause of this incident was quickly suspected as a fatigue fracture failure of the axle caused by a systematic failure of the axle grounding system. The ensuing corrective action plan included the immediate ultrasound testing of all the axles on the entire rail fleet. This action consumed most of the investigation and corrective efforts of the MBTA technical staff. Consequently, the critical action to immediately inspect all ground brush assemblies and axle rings was largely delayed by the focus on the ultrasound testing and partially by the publication of an engineering procedure to upgrade the methodology required for this inspection task. More than 90 days after the derailment (a period long enough for one inspection cycle of the entire fleet), a basic check of all the ground brush assemblies and axle rings could have been performed; however, less than a third of the fleet had been done.

In addition, during a site visit to a MBTA transit rail vehicle maintenance facility, the SME observed easily identifiable QA/QC process lapses that should have been flagged and remediated

by local supervision: No post inspection hands-on maintenance audits, improper tagging of defective parts, and storing defective and good parts together instead of isolating them. The SME also identified a shipment of new axles' ground brushes was missing the "condemning level marking", which is an important visual indicator for a mechanic to identify that the brush needs to be replaced. As another specific example of lax QA/QC oversight, the basic function of tightening bolts presented numerous concerns. The calibration dates of the torque wrenches were expired; however, the bolts were still installed and lastly, the required witness marks<sup>6</sup> were not present on the newly installed bolts.

The SME observed that 1979-81 Hawker-Siddeley fleet of 120 (114 active) cars operated on the Orange Line is scheduled to be retired by the commissioning of the CRRC new fleet. 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 Hawker-Siddeley cars show extensive car body corrosion, and in one instance, severe shelling of train wheel (see Picture 1 below). 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. Unmanaged vegetation can also create wheel adhesion issues, which will be elaborated on in the Safety Assurance section of the report.



The rail vehicle SME also looked at the commuter rail vehicle maintenance practices. Once again while not perfect, they were performing much better than their colleagues in transit. The SME's key findings of Keolis were grouped into three categories: (1) marginal material quality control; (2) marginal conditions at maintenance facilities; and (3) high turnover in the Keolis Chief Mechanical Officer position.

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<sup>6</sup> Witness marks are produced by placing a highly visible strip of paint across the head of the bolt, the nut and then on to an adjacent fixed surface. This practice alerts an inspector to any loosening of the securement hardware as the paint strips will no longer be in proper alignment.

The SME also met with the MBTA Senior Technical Manager to discuss the new car project management plan, quality program and commissioning of the CRRC new cars on the Red and Orange Lines. The SME categorized his key findings into seven areas: (1) outdated master test plan of Orange Line; (2) lack of official inspection procedures; (3) missing life cycle maintenance program; (4) commercial issues due to potential trade tariffs; (5) missing elements of the qualification tests program; and (6) ergonomic issues with boarding/alighting to and from the road and (7) provided commentary on a recent door safety related failure.

The rail vehicle SME provided recommendations to MBTA leadership and they are working toward addressing these concerns. As a start, MBTA management has stated that they will bring in an independent third-party consultant to oversee the vehicle maintenance QA/QC functions.

HNTB, a major engineering and infrastructure firm in the transportation industry, was contracted to perform an independent evaluation, which encompasses all tracks, wayside infrastructure, the contact rail, which is commonly referred to as the third rail and the Overhead Contact System (OCS). This inspection is limited to the transit operation, where the Panel believes the greatest risk is present. HNTB is providing daily reports to transit leadership of their findings and immediately alerts management if significant defects are identified, which can impact safe operations. The inspections commenced on September 14, 2019. As of October 31, 2019, HNTB identified 1121 “discrete items of concern” of which 46 (.04%) were immediate safety concerns.

In discussions with MBTA transit management, it appears that many of the defects identified by HNTB had been previously identified and documented by track inspectors (see Picture 2 below that depicts consecutive defective ties and missing fasteners). Therefore, in past practice, it appears that management did not effectively react appropriately to employee reports of track defects and take immediate remedial actions or when appropriate, install track restrictions.



MBTA leadership is working diligently to correct the defects found by HNTB inspectors and responds appropriately when alerted to an immediate safety concern. MOW managers have established a tracking system to ensure all items are appropriately prioritized and addressed.

Additionally, their management has been performing a crosswalk of HNTB's finding against their internal inspection processes to identify and correct shortcomings in their current program. The SRP is pleased with speed in which the T acted upon the recommendation to have independent inspections performed and is encouraged by the actions being taken to address the SME's findings.

Based upon these outcomes and discussions with agency employees, there may be other key legacy system assets that should also be evaluated by third party SMEs to determine whether the proper PMI and QA/QC functions are occurring, such as Fire/Life/Safety systems (standpipes), Ventilation and Drainage assets, as some examples.

Overall, the agency approach to mitigating hazards seems to be heavily reliant on long term Capital investments, which appears to be done at the expense of properly maintaining legacy system assets and keeping them in a state of good repair (SOGR). SOGR is defined as the condition in which a capital asset<sup>7</sup> is able to operate at a full level of performance. When transit assets are not in good repair, the consequences include increased safety risks, decreased system reliability, higher maintenance costs, and lower system performance.

As a result of supporting the accelerated Capital Program, many of the maintenance and engineering personnel are being pulled from their normal day-to day functions that are necessary to deliver reliable passenger service. If not addressed, this practice will further exacerbate safety concerns such as deferred PMIs and increase the backlog of work orders pertaining to maintaining legacy system assets at a fully functional level.

While the SRP recognizes the diligent efforts that have been made to improve organizational performance and safety, there still needs to be a balance created between delivering the Capital Program and keeping pace with PMIs and ensuring legacy system assets are fully functional. Therefore, this circumstance should be further evaluated as part of Safety Risk Management activities and CAPs implemented to address this safety exposure.

## **VI. SAFETY ASSURANCE**

An essential part of Safety Assurance is safety performance monitoring and measurement, which has four key activities that must occur; analysis of Safety Risk Management mitigation data, monitoring of regular operations, monitoring information from employee safety reporting systems, and event investigations.

### Analysis of Safety Risk Management Mitigation Data

Analysis of safety risk management verifies that mitigations are implemented, mitigations are effective/appropriate and performing as intended, and reduces safety risk and verifies that new hazards have not been introduced.

The MBTA is experiencing repetitive operational incidents; therefore, it is apparent that current mitigating strategies are not effective/appropriate and are not performing as intended. As

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<sup>7</sup> Capital assets principally include equipment, rolling stock, infrastructure, and facilities.

part of SMS, the CAPs intended to address operational incidents should have been sent back through the Safety Risk Management process to be re-evaluated and revised. However, this action is not occurring, i.e. transit management and safety personnel are not conducting a consequential analysis of safety risk management data as evidenced by the independent rail vehicle and track SME's findings.

### Monitoring of Regular Operations

Field observations differ greatly from auditing and inspections, as they are designed to promote the collection of safety data by simply watching employees work in his/her normal work settings. Field observations also highlight compliance with actual agency policies and practices, and are critical to ensuring that mitigations are working as intended. The results of observations should be regularly reported to management and reviewed.

As part of the safety assessment, SRP members interacted with MBTA mass transit and commuter rail staff in a variety of settings to conduct observations of field activities. As one example, Panel members performed a head-car ride on a segment of the Red Line for the purpose of engaging employees and performing roadway observations. In conversations with motor-persons, it became evident that they could not identify a specific individual as their immediate supervisor. Nor was there any indication that supervision was performing routine ride checks to gauge the caliber of individual employee's performance. The conversations also raised concerns regarding the working knowledge of one motor-person. When asked if he had experienced any safety issues of late, the motor-person informed the Panel that he was able to attain a greater than design speed on a rail vehicle, although the vehicle was in a restricted operating mode. When the SRP looked into this concern, we were informed that this is a known characteristic of this car class, which is part of the older fleet. Apparently, if these cars are operated on a downgrade in a restricted mode, according to their training, the motor-person is required to introduce a brake to control the speed of the train. The motor-person apparently was not aware of this operational nuance, which calls into question the caliber of the training.

In addition, during the train ride, a number of readily identifiable deficiencies were observed, i.e. unsecured fire extinguishers in train operator cabs, minor ride quality issues attributed to track conditions, sun bleached or dirty wayside signage, a hanging electrical conduit, as well as significant vegetation control issues. The SRP was especially concerned with the vegetation control issues, which on the surface may sound minor, but it can have serious consequences.

The MBTA's Light Rail Transit, Track Maintenance and Safety Standards, section LRT 213.37 states,

*“Vegetation on MBTA property which is within or immediately adjacent to the track area must be controlled. Vegetation is a deterrent to drainage and causes a wide range of problems within the right of way. Some consequences of vegetation control are:*

- (a) Fouled roadbed and ballast sections from roots and vines.*
- (b) Fire hazard, especially in dry weather or in the autumn.*

- (c) Obstructed visibility with respect to wayside signals, speed signs, etc.*
- (d) Safety hazard due to line-of-sight interference for operating personnel.*
- (e) Interference to employees performing track, power or signal duties.*
- (f) Improper functioning of signal and communication equipment.”*

In addition to the issues stated above, low hanging or fallen tree limbs have the potential to derail or strike moving trains, as well as injure a motor-person. Wet leaves on the running rails can result in rail adhesion issues and subsequently trains sliding through stations. This circumstance is not only disruptive to operations, it often results in train wheels developing flat spots and shelling, which accelerate the mortality rate of the wheel and are costly to correct. HNTB personnel routinely captured vegetation control issues throughout their inspections - two examples are depicted below.



At the onset of the assessment, the SRP discussed the status of the vegetation control program with transit management and was informed that it had been suspended. The funding for this activity had been exhausted as it was tied to other contractor support functions, such as snow

removal. During the discussion, a senior transit manager pointed out that unabated foliage was the number one cause of fire/smoke conditions or “Code 1” events at the T.

Performing vegetation control is low hanging fruit that costs the agency a minimal amount of money, yet it produces very tangible safety, operational and financial benefits, i.e. it reduces costly damage to train wheels, results in less system fires that can lead to service disruptions, and improves employee safety.

Conversely, during head car rides on a commuter rail line (Fairmont), it was apparent that the vegetation control program was effective. When a manager overseeing the Keolis contract was asked about their vegetation control program, he laughed and said, “I stopped just short of deforestation.” This individual had a full understanding of both the necessity and benefits of conducting vegetation control. It should be mentioned that the commuter rail line experienced a mainline derailment on March 8, 2018, on the Lowell Line at Wilmington Interlocking due to a train striking a tree/log during a weather related incident. The corrective actions included increased tree trimming along the ROW (see Picture 5 below). This incident should have raised red flags on the transit side of the house and provided ample justification for funding the vegetation control program.



It appears that on the transit side of the T operation, in many instances, financial considerations take precedence over operational performance and safety, even when it is extremely detrimental to the organization as described above. This mindset demonstrates an “upside down” set of priorities for running a transit agency. MBTA transit management has since reallocated funds to the vegetation control program and has resumed this activity.

A significant portion of the MBTA’s invasive maintenance activities occurs during late night hours as this is the most opportune time to perform work. These activities often involve complex operations that expose employees to significant hazards. In discussions with MBTA leadership, the agency’s Mechanical & Engineering (M&E) transit management does not have a prominent presence in the field during over-night hours, which is when the most work is being conducted. Appropriate managerial oversight is essential to ensure productivity, evaluate the caliber of work being conducted and to improve the safety oversight of the workforce. In order to

monitor daily operations, leadership needs to be routinely present in the field. MBTA management has committed to improving in this area.

In addition, there is essentially no safety personnel present once the day-shift ends. The SRP was told that one safety person works the PM shift and there is an “on-call” person for the mid-night tour. In the event of an incident, senior Safety department personnel will respond to the scene depending on the severity of the incident. This once again illustrates that the Safety department is reacting to lagging indicators, as opposed to proactively championing safety in the field. The Safety department is performing an analysis of their current level of resources and functions to address this issue.

### Employee Safety Reporting

Safety Assurance activities are heavily dependent upon effective employee reporting to collect critical safety information. 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. As a result of the “blame” culture, the SRP believes that many safety issues today most likely go unreported by the workforce.

Perceived or real, employees in general do not trust their leadership and therefore, do not share what is happening in the field. They fear heavy-handed discipline will result. The workforce doesn’t feel supported and are clearly frustrated with management’s lack of responsiveness to their needs. We heard of countless situations where employees ask for needed safety equipment or support without any action occurring. During this review, we also heard and gained first-hand knowledge of employees, who reported safety issues over and over to a point where they lost faith in management’s ability to care about getting anything done.

In organizations where there is widespread distrust between labor and management, third party safety reporting systems have been successful. The information collected is scrubbed of any identifying characteristics by an external third party before it is shared with the agency to protect the identity of the reporter. One example of a non-punitive confidential close call reporting system is the C<sup>3</sup>RS, which is in place at Keolis. This system is a partnership between the National Aeronautics and Space Administration (NASA), and FRA, in conjunction with participating railroad carriers and labor organizations. Employees can report safety issues or “close calls” voluntarily and confidentially through a third party.

Another confidential close call reporting program is operated by the Bureau of Transportation Statistics (BTS) under an agreement with the Washington Metropolitan Area Transit Authority (WMATA), which allows their employees to voluntarily report close call events without threat of disciplinary action. BTS also protects data and information collected for statistical purposes under the “Confidential Information Protection and Statistical Efficiency Act” (CIPSEA) of 2002, which established uniform confidentiality protections over disclosure and use.

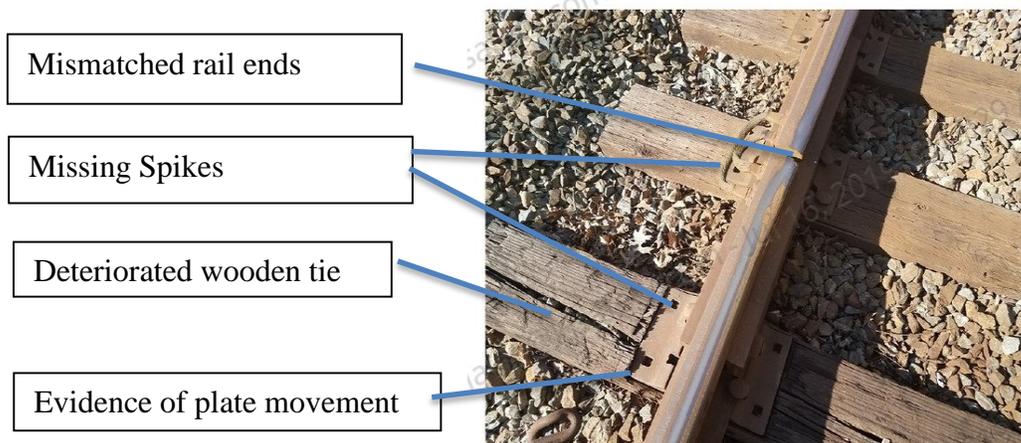
### Event Investigations

The FTA requires transit agencies to include the investigation of safety events as part of their PTASP. The level of safety at an organization is often directly linked to its capacity to conduct an effective accident investigation, as this activity is central to identifying causal or contributing factors in events. Effective investigations require the knowledge of SMEs to aid in identifying deviations from current operating or maintenance practices, as well as independence to ensure the objectivity of the process.

The MBTA Safety department is responsible for producing the agency’s final accident investigation reports; however, there is only a single person within the Safety department’s accident investigation team that can be considered a SME. This individual has Transportation Operations experience. Therefore, the Safety department cannot lead an independent, comprehensive accident investigation, and this inadequacy is even more pronounced for events centered around M&E issues.

As one example, on February 5, 2019, there was a derailment on the Green Line between Beaconsfield and Brookline Hill Stations, which involved wheel climb at a track rail joint. There were multiple track defects simultaneously co-existing at the Point of Derailment (POD). The curved segment of track involved in the derailment had recently had a rail replaced at the POD, which created a mismatch from the head of the existing rail to the new one. There was a significantly deteriorated wooden railroad tie that potentially created rail joint support failure (pumping of the wooden railroad tie beneath the rail joint). The deteriorated wooden railroad tie in question was replaced during post incident activities, which also corrected an existing wide gauge defect. The pictures taken at the time of incident, reflected that both of the track plates beneath the rail joint were missing securement hardware (spikes) on the field side of rail. Lastly, there was approximately ½ inch of lateral rail movement as evidenced by the markings made by the track plates shifting on the surface of the wooden railroad tie (see Picture 6 below).

Picture 6: Green Line Derailment between Beaconsfield and Brookline Hill Stations.



MBTA Track Maintenance and Safety Standards<sup>8</sup> states that track defects should not be viewed in isolation and that remedial action may be required when a combination of track conditions are present. In this event, based upon the cumulative effect of the defects, the appropriate action to avert a derailment should have been to either perform immediate repairs or have an operational restriction placed on that segment of track. Obviously, this did not occur.

The Safety department report found that although there were multiple track defects present at the POD, no single defect was out of tolerance; therefore, there were no recommendations made and no CAPs were created. The primary corrective actions were the replacement of the deteriorated tie and the profiling of the rail ends, which are symptoms of a poor PMI regimen. These corrective actions do little to globally prevent a future derailment.

The circumstances described above should have raised numerous red flags for an experienced accident investigator with rudimentary M&E Track experience. However, there did not appear to be any diagnostic activities performed to gauge the health of the Track department's PMI programs. As some examples, there was no discussion in the report to determine when the last time a track inspection occurred; whether the inspections were occurring at the required intervals, whether the existing defects were previously identified or whether they were correctly risk ranked according to MBTA track inspection standards. Nor were the results of any recent automated inspections available, i.e. track geometry and ultrasonic testing. Other potential contributing factors that are typically explored in an investigation were not discussed, i.e. were the track inspectors responsible for the area properly trained? Is the training adequate and is he/she in compliance with initial and recertification training?

The same investigation report does not speak to any safety concerns surrounding the rail renewal activities, i.e. Why was the original rail replaced? Why was the new rail left improperly secured (missing spikes)? Why was the new rail left sitting on a significantly deteriorated wooden railroad tie? And why wasn't the wide gauge or rail head mismatch addressed? These circumstances call into question the caliber of maintenance activities, as well as the qualifications of the individual supervising the installation of the new rail and management oversight practices in general.

In addition, it appears that once management has identified what they perceive to be the "root cause" of an incident, the organization narrowly turns its attention to a single causal factor. This practice reduces the likelihood that any secondary contributing factors will be surfaced and appears to be the most prevalent when a human error is identified as the root cause of an incident. The Green Line derailment that occurred at Riverside Station on August 7, 2019, appears to crystalize this circumstance. The event was attributed to a "rookie" operator's failure to identify an incorrectly aligned track switch, which subsequently resulted in a derailment after he "trailed the switch"<sup>9</sup>.

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<sup>8</sup> MBTA MOW Division, Green Line – Light Rail Transit, Track Maintenance and Safety Standards, LRT 213.1 Scope, states in part, "...The requirement prescribed in this section apply to specific track conditions existing in isolation. Therefore, a combination of track conditions, none of which individually amounts to a deviation from the requirements of this section, may require remedial action to provide safe operations over the track."

<sup>9</sup> The term "Trailed Switch" is common transit industry vernacular used to describe a circumstance where the switch points of a track switch are not properly aligned for train movement off of a specific track(s). The train operator

At the time of the incident, the organization appeared to be content with this determination, which is illustrative of a “blame culture.” In subsequent discussions between the SRP and MBTA transit management, the Panel expressed the belief that disciplining employees for operational errors will not substantially reduce the frequency of these events; however, implementing sensible strategies to mitigate risk will.

Motor-persons are trained to determine switch position by “reading the iron”, i.e. observing the position of the switch points to confirm that they are correctly aligned for the move in progress. The track switch involved in this incident is not equipped with any device that provides a visual cue to motor-persons to aid them in determining the position of the switch points. The installation of a switch stand that typically has a green or yellow flag attached or other similar technology is a relatively inexpensive retrofit that can be implemented to reduce the likelihood of future trailed switches. The switch position can also be tied into the signal system and prevent a clear aspect from being displayed unless all of the switches in the route are properly aligned. In addition, there are critical locations on the Green Line where the MBTA’s operating rulebook requires a motor-person must restore a track switch to its “normal” position after use. The rarely used track switch involved in this derailment may be another candidate for such a rule designation. Transit management has since reconsidered disciplining the employee involved in the event and they are contemplating design modifications for this model of track switch. In addition, Operations and Safety management is evaluating the current training of motor-persons.

The SRP performed a field visit to another derailment site (St. Mary’s Station). In this instance, the MBTA’s derailment committee determined that the track switch had operated beneath a non-revenue train that was traversing it, resulting in a derailment. The root cause was determined to be a failed cotter pin, which permitted a securement bolt to back out of its yoke, which was followed by the undesired movement of the switch points.

A Track manager briefed the SRP member on the actions being taken to prevent a similar derailment in the future. The securement hardware for the yoke assembly was modified to a more robust design. When asked if the agency had an approved engineering drawing that details the modifications, the manager said that documentation was not prepared. However, he went on to state that the new design was reviewed and verbally approved by the Track Engineering department. Upon entering the trackway and examining the switch involved in the derailment, there was a new bolt and securement hardware installed; however, it was not the same components as the “approved” hardware. In addition, a second switch in the area was visually examined and although it had upgraded hardware installed, it also was not the Track Engineering “approved” hardware.

Part of safety risk mitigation analysis is to verify that new hazards are not being introduced; therefore, the alteration of asset components should follow a regimented engineering design modification and documentation process. The above circumstance demonstrates lax configuration control protocols and reflects that the M&E department is not sufficiently involving the Safety department in critical day-to-day decisions.

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than traverses the track switch and damages the track switch components, which will oftentimes result in a derailment.

All of the issues identified above should have been flagged as part of event investigation activities. In addition, there should be a healthy tension between Safety and Operations personnel when performing investigations; there is not. The MBTA derailment committee structure heavily relies on Operating personnel to identify causation. As a result of the Safety department's lack of SMEs, they are basically rubber-stamping Operation's findings without challenge.

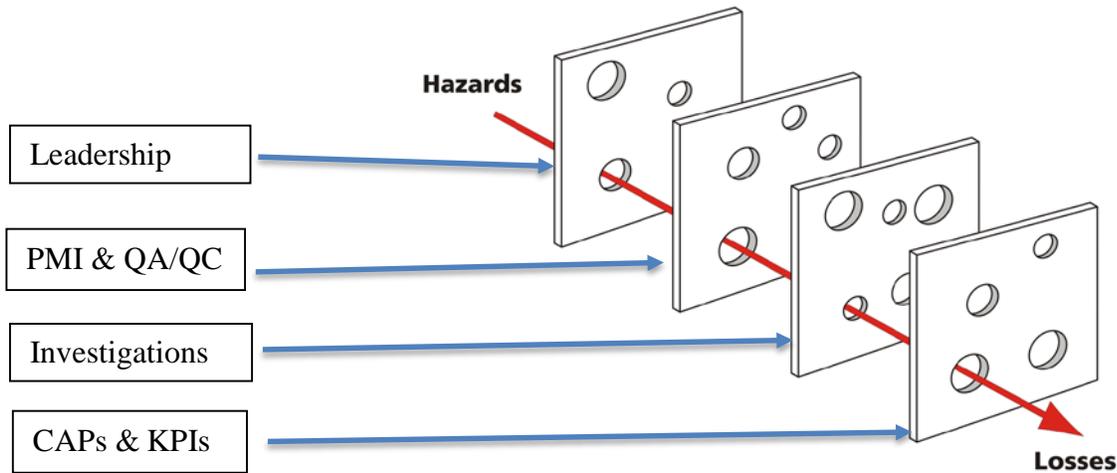
Operations managers are not independent; therefore, investigations are further hampered by a blame culture, where culpable managers may not bring information forward out of fear of reprisal. Consequently, the final investigatory product is not surfacing the systemic safety issues that are impacting the organization's performance. This circumstance calls into question, the "sufficiency and thoroughness" of the investigations and demonstrates a need to substantially improve in this area.

The safety departments of many large transit agencies have dedicated SMEs, whose primary function is to conduct incident investigations. The MBTA should benchmark accident investigation practices utilized by their peers and adopt the practices best suited for the T. Once again, the commuter rail side of the MBTA operation appears to be performing much better in this area, as the safety team at Keolis contains a number of qualified SMEs.

Effective PMI programs, as well as QA/QC activities, are the agency's primary defenses against operational incidents. Intense concentration on these activities should be one of the central focuses of an accident investigation. More importantly, simply performing required PMIs and having effective QA/QC programs will dramatically reduce operational incidents.

James Reasons developed the "Swiss Cheese" model to illustrate an organization's defenses against failure. These series of barriers are represented as slices of swiss cheese. *See* Figure 2 below. The holes in the slices represent weakness in individual parts of the system and are continually varying in size and position across the slices. The system produces failures when a hole in each slice momentarily aligns, permitting "a trajectory of accident opportunity" so that a hazard passes through holes in all of the slices, leading to failure.

Figure 2: James Reason – Swiss Cheese Model<sup>10</sup>



The Safety department would benefit from implementing a dedicated independent investigation team that has both the skillset and the bandwidth to delve deeper into incidents. Once MBTA management has a better understanding of the causal and contributing factors that are driving the agency’s undesired events, they will be better prepared to formulate and implement CAPs.

## VII. SAFETY PROMOTION

The Safety Promotion component of SMS requires the agency to establish a comprehensive training program for all agency employees and contractors responsible for the management of safety in their system. The training must include refresher training as necessary.

### Training Programs:

The SRP observed that the MBTA transit training function is decentralized which creates internal oversight issues regarding assessing the consistency and caliber of the training that is being delivered. Specialized training is often delivered by union leadership or is housed within the various MOW departments. The SRP choose to meet with transit Operations Training team to discuss their processes, as this group is the largest training entity at the T. Training is another area that is somewhat data deprived due to not having effective data collection systems in place. Therefore, it is unknown if all the required initial and recertification training is occurring or can be validated. In addition, there are no global targets and indicators to alert executive management of the status of training compliance rates at the agency.

The Panel was told that the operation’s training group was hit hard by budget cuts previously imposed by senior management. While the reduction in everyone’s budget was universally applied across the agency, other parts of the organization were able to absorb some of

<sup>10</sup> Figure 2: The labels contained within Figure 2 were created by the SRP for illustrative purposes.

the financial impact by reducing non-personnel expenditures, such as material purchases. The training group had to surrender personnel to meet the target due to having a small material budget.

This reduction created challenges meeting their existing workloads and it has been compounded by providing ROW training to waves of contractor personnel coming onboard to support the accelerated Capital Program. This group was also heavily relied upon to support the manual block operation following the Red Line derailment. However, if we set these two recent demands aside, the previous headcount reduction resulted in them continuously over-running their overtime budget.

Training management and budget personnel have a scheduled monthly meeting where overtime is discussed. The Panel was told that each month, the Operations Training staff asks for additional headcount to keep pace with their workload, and each month the budget personnel chastises them for not staying within budget. When asked by the Panel how many times has the same discussion been repeated at these meetings, the manager estimated that it was approximately 20 months in a row. This recurring meeting provides no resolution to this dilemma and reflects organizational paralysis. This circumstance illustrates the need for an organization-wide zero based budget (ZBB) analysis. The Panel was told that there will be a headcount increase in Operations Training staff.

Select SRP members attended the required ROW and RWP training to be certified to enter the roadway. In addition, attending the training provided the Panel members with the opportunity to informally audit the courses. The ROW class was scheduled to start at 07:00 hours at which time, approximately forty-three people arrived to take the course. The volume of attendees and a lack of a defined class roster resulted in a substantial delay (one hour and thirteen minutes) before the actual training commenced. The SRP was informed that past practice was to have two people deliver the training: One would handle the administrative functions, while the other concentrated on teaching.

The late start and volume of students created time management challenges for the lone instructor that were manifested by him somewhat hurrying through the course to stay on schedule. As a result, critical information was often glossed over or not discussed at all. In the most glaring example, the instructor skipped over the 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 the 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.

The SRP was informed that professional color training manuals are no longer printed by an external vendor due to budget constraints. 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. This class may be the first introduction to a rail transit environment for many of the students. The speed in which critical material was covered raises concerns that novices to the transit industry may not have absorbed enough working knowledge to recognize a ROW procedural error or that they will not have the confidence to invoke a Good Faith Challenge<sup>11</sup> if they are in a dangerous situation.

The ROW training course also raised concerns regarding the organization's understanding of the requirements for the use of Personal Protective Equipment (PPE). The training was not consistent. One training class did not define helmets or eye protection as requirements for entering the right of way, while a different training forum stated helmets are required. There was no mention in the ROW training regarding wearing appropriate footwear until reaching the discussion of entering construction sites. This circumstance appears to be more of a lack of organizational clarity on the requirements for PPE usage, as opposed to a training issue.

As one example, a Panel member responded to a live derailment scene occurring at the Reservoir yard. While at the site, it was observed that very few individuals other than management were wearing helmets or eye protection. Many of the frontline employees were engaged in activities such as removing track switch covers, or repositioning re-railing equipment without wearing work gloves. Additionally, the employees at the derailment site had on a wide variety of footwear. MBTA management at the site did not raise any exceptions to these circumstances. Therefore, the workforce does not have a clear signal as to what is expected for PPE usage at the organization. Transit management needs to define their minimum standards for PPE, communicate the standards to the workforce and enforce them.

The ROW and RWP training is another area where the MBTA may benefit from benchmarking against other transit agencies. Many RTAs include a field exercise as part of the curriculum to expose students to live train movement under direct supervision in a very controlled environment.

#### Communications:

Safety Promotion also requires the agency leadership to communicate safety and safety performance information throughout the organization, that at a minimum conveys information on hazards and safety risks relevant to employee's roles and responsibilities. Communication should also inform employees of safety actions taken in response to reports submitted through an employee safety reporting system.

MBTA leadership has not established critical KPIs; therefore, performance information cannot be disseminated. This circumstance creates an environment where agency executive management and the FMCB are blind to organizational risk and safety is not at the forefront of the MBTA. As such, correcting this circumstance must be a priority for the organization from both a safety and operational effectiveness standpoint. Let us circle back to some of the recent derailments. It is plausible that many of these events could have been averted had KPIs for rule

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<sup>11</sup> The Good Faith Challenge process permits an individual to challenge the level of ROW protection provided if they do not believe the current level of roadway worker protection is adequate for the task at hand or is not correctly implemented.

conformance testing, PMIs and QA/QC measures existed and performance deficiencies in these areas been previously addressed. In addition, it is telling that no one at senior levels of the agency or FMCB recognized this lack of data as a short-coming. Therefore, the skillset of both parties should be examined and corrective actions developed to improve performance.

Budget reports are measuring the performance of the financial plan, but a more comprehensive measurement system is needed with key metrics to monitor service. Performance measurement data can provide transit agency management with objective assessments of current circumstances, past trends, existing concerns, and unmet needs. It should track how well the agency is delivering daily service and should include tracking of the reliability of service, the quality of customer contacts with agency staff, passengers' physical comfort while using transit, and the achievement of service goals. The system should also monitor passenger's travel time and the customers' perception of the overall reliability of the system.

As mentioned earlier, employees lack trust in their leadership or fear retribution so they generally refrain from reporting issues or identifying themselves in any reports. Therefore, until this issue is corrected, leadership will not be receiving a significant amount of employee reports of safety concerns, which can result in lingering safety concerns going unaddressed.

### Continuous Improvement

Continuous Improvement<sup>12</sup> is a process by which a transit agency examines safety performance to identify safety deficiencies and carry out a plan to address identified safety deficiencies. Evaluation of the SMS is necessary to ensure that it effectively and efficiently allows the agency to meet safety objectives and performance targets. Transit agencies should address any identified weaknesses in SMS organizational structures, processes and resources in a timely manner, and should also complete annual reviews of overall safety performance.

Continuous improvement occurs from:

- Timely safety information that enables executives to make informed decisions about allocating resources
- Accountability being placed at the appropriate levels of authority
- The ability to actively identify hazards and mitigate safety risk, based on prioritized allocation of resources
- Support for system-wide communication about safety issues up, down and across the agency
- An improved safety culture that empowers employees and solicits information from them on safety hazards and concerns.

Continuous improvement is an auditing function which allows the agency to:

- Assess the effectiveness of the SMS to determine if it is performing as intended
- Assess adherence to agency's written and intended SMS policy, procedures and processes

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<sup>12</sup> Federal Transit Administration, SMS Safety Assurance Participant Guide, v12\_09282018 was used as the basis for the material in the continuous improvement discussion.

- Identify the causes of sub-standard performance
- Develop corrective action plans to address sub-standard performance

CAPs are instituted when the SMS, or any part of it, is not being performed properly. Perhaps hazards are not being identified, no one is addressing the condition once the hazard is identified, or agencies are not following through on implementation activities or data collection.

Continuous improvement tools and activities include conducting self-assessments, audits, gap analysis and external reviews. The results of continuous improvement activities must include identification of breakdowns and disconnects, such as practical drift<sup>13</sup> and correct the process at the level where it is broken (frontline, department level, or at the broader organizational level).

Even when fully implemented, the continuous improvement sub-component of SMS is always relevant and always improving to meet the needs of the agency. It should never be viewed as complete. The transit industry is never static: personnel, equipment, technology, routes, tracks and the operating environment change constantly. Therefore, SMS will continuously change, adapt and be refined, evolving as necessary to meet organizational changes and objectives.

This evolution of the SMS is a primary goal of continuous improvement: ensuring that formal activities and tools are in place to regularly verify efficiency, effectiveness and ongoing improvements in the management of safety.

### SMS Maturity Level

MBTA transit management has instituted the Safety Management Executive Review Committee (SMRC) to oversee and guide the implementation of SMS. The committee is comprised of various internal stakeholders. While the MBTA is making progress in implementing SMS, there is clearly a need for further improvement in the many areas described throughout this report. Therefore, one effective way to have a clear strategy for SMS implementation is to conduct an SMS gap analysis to determine the agency's current SMS maturity level.

One useful resource for performing that assessment is the SMS Gap Analysis Report<sup>14</sup> produced by the FTA while performing this activity at WMATA in 2015. The report provides guidance that the MBTA can look to on how to conduct this activity. The report contains 78 questions regarding the status of the agency's SMS. While each agency is different, this document provides a foundation for launching this exercise.

The report is organized into four key areas:

- SMS Levels of Maturity Table – presents the general criteria for maturity level placement and guidelines for SMS implementation phasing;
- Summary of SMS Maturity Levels – provides an average score for each SMS major component and sub-component based on a scale of 1-4;

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<sup>13</sup> Practical Drift means the slow and inconspicuous, yet steady, uncoupling between written procedures and actual practices during the provision of services.

<sup>14</sup> US Department of Transportation, Federal Transit Administration SMS Gap Analysis Report, Washington Metropolitan Area Transit Authority, June 17, 2015.

- SMS Gap Analysis Report Results – discusses results from the gap analysis by SMS component and presents the phase of implementation maturity;
- SMS Maturity Table – presents the SMS maturity level for each SMS sub-component item.

## **VIII. FINANCIAL REVIEW:**

### Strategic Plan

After being established in 2015, the charter of the FMCB was to formulate a strategic plan to stabilize and strengthen the financials, management, operations and asset condition of the MBTA. The legislation mandated that the plan provide a *safe, reliable and sustainable* transit system. The plan was to be consistent with the state comprehensive transportation plan, establish fiscal stability and ensure that the Authority’s budgets were aligned with its operational and capital needs. The plan was to also focus on providing better service, facilitating sound management, developing a financially responsible plan for preserving assets, meeting future needs for regional transit facilities and services. In addition, the Board’s plan was to include performance metrics and measures.

The FMCB has prepared a Strategic Plan. The importance of a Strategic Plan is to provide direction to MBTA. It should outline measurable goals. Strategic planning is a tool that is useful for guiding day-to-day decisions and also for evaluating progress and changing approaches when moving forward.

The major elements of a strategic plan are: Mission, vision, aspirations, core values, SWOT analysis and objectives.

- The Vision statement, “MBTA will provide globally premier, safe, reliable, convenient, accessible, cost effective and sustainable transit service to its communities” is inclusive of safety and consistent with the legislative mandates. Safety as the primary objective is somewhat obfuscated by the aspirational statement of the agency being “globally premier”.
- The Mission statement that “MBTA provides access and moves people while strengthening and improving economic health of the region” does not allude to accomplishing this in a safe manner.
- The Core values has safety at the top of the list. Safety of the public and staff is top priority in the list of values set forth in the Plan.
- The Guiding Principles of the plan has safety as the number one objective stating that the Agency should “Never compromise safety”.
- The specific objective pertaining to safety in the plan is to “sustain the MBTA’s organizational commitment to ensuring the safety of passengers, the workforce and the general public”. The plan indicates that this entails ensuring an organization-wide commitment to managing safety risk and assuring that all transit activities are adequately resourced and supported to achieve the highest level of safety performance. The objective includes the four components of SMS: safety management policy, safety risk management, safety assurance and safety promotion. The objective states that the intent of SMS is to shift the safety culture from reactive to proactive.

The benefit of strategic planning is that it is a formalized, documented organizational management process used to analyze the condition of the Agency, set priorities, and to focus resources. Each of the principles in the plan were to be expanded with specific objectives, strategies, targets, and timelines for deliverables. However, the objectives supporting Capital Delivery and fiscal control are the ones that have received the most focus and have been the priority of the Board. Delivery of the Capital budget has become the backbone of the strategic and tactical planning for the agency.

In its December 2018 update, the FMCB reported on the attainment of four Strategic Plan priorities and the timelines for those priorities. Safety was not one of those priorities but could be implied in Key Priority number one. They were as follows:

- Key Priority 1: Improve customer experience across the system, focus on buses, reinvent the bus system with reliable service, improved vehicle and bus stop amenities and a comprehensive redesign of the entire bus network
- Key Priority 2: Accelerate capital delivery spending to eliminate the SOGR backlog in 15 years rather than the previous 25-year target
- Key 3: As part of the effort to deliver reliable service to affordable fares, have a new Automated Fare Collection (AFC) system by 2021, operating under a new fare structure that simultaneously drives revenue and ridership, while addressing affordability
- Key Priority 4: In order to eliminate the need for annually appropriated supplemental operating support while ensuring that the MBTA provides great value to users and taxpayers, continue to drive down operating costs and increase non-fare, own-source revenue to \$100 million by 2021.

The FMCB also recognized in the safety objectives that “asset management and life-cycle maintenance are the keys to ensuring that the MBTA’s asset never again fall into disrepair”. But there are no metrics measuring the performance of preventative maintenance. The plan deliverables are defined as the implementation of the Transit Asset Management (TAM) system and delivery timeline for some major capital projects.

### Annual Budget

The FMCB has been successful at managing, monitoring and focusing on balancing the operating budget. The objective has been active budget management and maintaining fiscal discipline. They have conveyed the purpose of the financial objectives to the organization and provided direction to make decisions on allocating resources at the MBTA. In fact, the performance against budget has been the primary goal setting and monitoring activity at the agency in addition to year over year trends for the spend rates of capital. The budget is assiduously monitored on a monthly basis against the expected financial levels approved for the current year. This process has controlled the deficit spending. The initial FY20 budget had a deficit of \$36.5M and staff indicated that requests for additional expenses were about \$150M more than allocated over the prior year’s budget. The budget is balanced for the fiscal year, but the proforma forecasts recognized that there are challenges to sustaining that in the future.

The strategic plan objectives for capital delivery seem to be the most widely disseminated throughout the organization with less emphasis on safety. 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. The charter of financial controls has led to several years of deep budget reductions which has permeated every level of the organization and left Operations the hardest hit. The budgeting culture is characterized as a totally top down approach. The expense reduction process has been dictated as an across the board percentage cut. The positive to that approach is that it is easier to manage and meet the financial goal of a balanced fiscal year budget. But the consequence to that approach is that it lacks input from those on the front line delivering the service. The across the board percentage reduction mandate has led to some serious manpower shortages in critical departments that support operations and service delivery. Budget resources are lacking in critical areas (training, manpower for operators needed to build and make schedules, maintenance crews, emergency response teams and safety) which may be affecting the safe delivery of services. There is also no contingency in the budget for safety emergency related issues. These are addressed on a as-needed basis by realigning budget from other departments or through the Pay Go fund if it is capital related.

From discussions with staff, there has not been critical or clear assessments of their functions and needs. A recommended approach to this issue would be implementation of a ZBB process, where each department must justify the need for positions and expenses that support the core business function of delivering transit services to the public. The objective of ZBB is to look for efficient ways to evaluate and allocate costs. ZBB is a more resource intense budget process, but it would be offering more fairness and improve communications with the front line. In the Focus group sessions conducted by the Panel, there were comments from operations departments that have been “cut to the bone”. The current perception is that operations is subject to the same percentage reductions as some overhead and administrative functions that do not support customer service or generate revenue.

To compound the issues of evaluating resources is the lack of organizational charts. Organizational charts are needed for all levels of the organization to provide transparency, information and accountability about functions. There are fragmentation of support service and operation delivery functions such as Procurement, Contract Administration and Training. Organizational charts would aid in the assessments of functions, their efficiency, alignment and the criticality to the core business of the organization for service delivery.

A ZBB process would force a review of the needs and resources of critical functions. With the potential challenges for the future, it is time to examine the mix of expenses in the budget and to look at ways to provide more of an opportunity to assess secondary effects of financial decisions. This will ensure that within the funding parameters, there are sufficient allocations for critical functions. This assessment should not be performed by working from the top down, making the biggest decisions behind closed doors without enough input from front line staff.

Inclusive communications and processes at all levels of the organization is not only missing in the budgeting process but also in the policy and planning decisions. Reaching out to all levels of the organizations represents an opportunity for improved communications and to obtain thoughtful input and guidance on complex issues at the agency.

In an article on lessons learned from the recovery efforts of Hurricane Katrina, Scott Cowen, who was the President of Tulane University, stated “Disregarding different and opposing perspectives can block the emergence of ideas and solutions. Leadership should never be about one person’s agenda; it’s about facts, mission, vision, values, and principles. Consequently, it is of great importance to seek inclusive dialogue.” He emphasized the importance of seeing the entire picture. MBTA could benefit greatly from the perspective of those doing the work on the front line, who not only respond to emergencies but also deal with daily operations.

### Capital Budget

The transit agency’s Accountable Executive is responsible for balancing transit asset management, safety, day-to-day operations, and expansion needs in approving and carrying out a TAM plan and a PTASP. The FTA has stated that “when transit agency assets (e.g., vehicles, rails, and facilities) are not maintained well, condition deteriorates, maintenance backlogs grow, and asset conditions become poor or marginal. The result is decreased safety and reliability, increased maintenance costs, and the potential for having to replace assets sooner than would have otherwise been necessary”. SOGR at MBTA has been viewed primarily as a capital renewal initiative, and not as performing routine preventative maintenance, which is absolutely necessary to keep legacy assets fully functional.

A key priority of the FMCB has been acceleration of capital delivery to reduce the time span of bringing the system into a SOGR with emphasis placed on increasing the capital spend rate. The FY20 budget has allocated 80 addition positions to capital delivery. There have been several initiatives to improve capital delivery including administrative reorganization, recruitment of additional oversight and project management staff, creation of Capital Delivery and Chief Engineer Offices, project management software implementation and project accounting. This is leading to a more robust capital delivery effort. However, it does not appear that the impact on Operations staff to support the CIP has been fully contemplated.

There is widespread concern that focusing predominantly on capital delivery is occurring at the expense of the operating needs. While the agency recognizes the need for additional operating personnel and has plans to substantially increase operating staff, it currently takes 100+ days to hire a position through a multiple step Human Resources process. The acceleration of the CIP will increase the reliance upon and utilization of Operations staff as it needs to draws 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, such as fatigue. This circumstance places additional burdens on Operation’s staff, who feel that they are already underfunded to perform day-to day tasks.

Several programs have been initiated to bolster capital funding, while having a detrimental impact upon operations spending that has been constrained through budgetary actions:

- 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, Operations instructors having to respond to emergencies and run manual blocks).

- CIP Investments: Every operating dollar saved is invested into the CIP. That puts pressure on the operating budget. The FY19 budget overview indicated that FMCB targeted \$150M annual transfer of operating dollars to the CIP. They stated that deficit spending deprives the CIP of that funding. But it also deprives the operational resources necessary to perform daily maintenance.
- FY20 cost savings initiatives: HR process takes over 100+ days to hire but the rationale for budget cuts in the budget was to eliminate current hire list, eliminate approximately 20% of the existing open positions. Another double whammy on Operations.

There is a huge organizational focus on capital delivery and expansion. Capital delivery is dependent upon resources from M&E. 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.

The assumption is that current capital investment will significantly reduce capital need once new assets are in service, but if the daily maintenance is not done, then the system will fall back into a state of disrepair.

There are different perspectives in the organization that need to be reconciled to effectively coordinate and communicate the strategy. The top feels that the financial house needs to be in order and that the discipline must continue. The bottom of the organization feels that they are not being listened to and that the fiscal cuts have been too deep. The financial process needs to be reexamined to provide efficiencies and flexibility to address the needs of daily operations and the capital spending. Therefore, the leadership of the organization must assess this circumstance and strike a balance between delivering the accelerated CIP and maintaining legacy assets that contribute to the safety and reliability of the system for riders every day.

## **IX. Safety Culture**

### Culture

Today, culture is one of the most discussed subjects of organizational life. It permeates every aspect of a business. In its simplest form, culture is defined as the system of behaviors, beliefs, norms, and values that shape how work gets done in an organization. It has been determined that an organization's culture has direct impact on employee/customer safety, satisfaction, and business performance. Culture transformation is not an overnight 'check the box' activity. Rather, it takes years of dedicated persistence to transform an organization from its current state to a healthier more productive future state. The MBTA leadership needs to be intentional about the safety culture they want to create and sustain. Conversely, if they choose to do nothing, a culture will result by default.

In over 9 hours of dialogue via Focus Groups, the SRP learned much from a diverse set of employee disciplines about the MBTA's culture and how it values safety. A Focus Group is a

form of qualitative research consisting of interviews in which a group of employees are asked to share their perceptions, attitudes, and opinions about specific topics within the organization. In regards to the MBTA, the questions focused on the MBTA culture specifically as it relates to safety, leadership effectiveness, and level of employee engagement.

Our objective was to hear the voice of those on the frontline. It became apparent to the team 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. In addition, the 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.

Sixty-eight percent of the participants gave a grade of C and below regarding the perception of how the T views safety, with the average grade being a C. *See* Appendix D for focus group composition and questions. In general, the participants felt that the safety department is more reactive than proactive. In addition, outstanding hazards and work order tickets are not responded to in a timely manner and are often considered not urgent until an incident happens. Focus group members, from the operating departments, shared that there are no longer any requirements for safety briefings and there is an inconsistent application of safety discipline. Support functions didn't see safety as part of their job.

In regards to employee engagement level (on a scale of 1-5), the average rating was 4.2. Eighty-six percent of participants feel engaged while they are at work and stated they will give their all. However, a majority of the participants said that once their workday is over, they are done. They will not volunteer to assist the organization after normal business hours. Clearly employees feel pride in the functions they perform, but also feel frustration with the organization they perform it for.

### Blame & Retaliation

At the MBTA, the lack of trust with leadership was by far one of the most often cited issues from all the groups. When it comes to safety, employees felt that the organization has created a blame and retaliation culture. The impact of this lack of trust, resulting from blame and retaliation, has caused employees to stay quiet when they see hazards and unsafe conditions on the property.

Learning from mistakes has proven to be one of the best teaching moments that builds an effective safety culture. It is far more important for leadership to really know what is going on within the organization. When the culture exists where blame always needs to be associated with an incident, the result is a lack of trust where employees will avoid self-reporting. Another example is a situation where employees look over their shoulders out of fear that they are being monitored and/or being set up. From a cultural health perspective, when an employee lacks trust or is fearful of leadership, they tend to drive important communications underground. Mistakes never get brought to the forefront out of fear of discipline, blame or retaliation. Employees may attempt to keep important information from their supervisors or cover up incidents or facts that are critically important for leaders to be aware of. When a culture like this is prevalent, for every

safety related incident that management becomes aware of, it is likely that many events are covered up or not reported so as not to gain management's attention.

### Changing Leadership

Much of the work involved in this safety review is deeply rooted in the culture that has evolved over time. Changes in executive leadership will always have a strong impact on whether cultures grow, deteriorate, or simply sustain in the current state. It is important to note that since 2010 there have been 9 new GMs leading this organization. Each of these individuals brought to the position his or her business priorities, goals, and style. The agencies accomplishments throughout this period relied heavily on the GMs priorities and the political environment that guided the organization's direction.

Additionally, there is no question that the interaction between staff and the FMCB has resulted in significant and much needed accomplishments. However, the FMCB is required by legislation to meet 36 times a year. The preparation, participation and demands placed on staff to support these frequent meetings takes an extraordinary toll on agency leadership. It is apparent that staff dedicates an overwhelming amount of their time to this effort, which takes them away from their daily responsibilities. The SRP cannot overstate how detrimental the frequency and demands placed on staff to prepare for these meeting are to the overall safety and operational performance of the organization.

### Talent Acquisition

The MBTA, like other public transit properties, is facing a talent and succession dilemma. Pension plans and good healthcare benefits entice people to join the organization and stay until they are retirement eligible. During fiscally difficult times, budgets are cut which result in hiring and salary freezes. In the case of the MBTA, the hiring freeze and reduction in headcount, was exacerbated by the most seasoned and knowledgeable employees accepting management sponsored "buy outs" that resulted in significant brain drain. With no clear succession planning or employee development processes in place, the organization finds itself limited in its ability to effectively run the system. Without even realizing it, a safety culture gets formed; unfortunately, it is one of poor operational performance and neglect of infrastructure assets. These talent issues have attributed to the MBTA's poor safety culture.

In FY 2017, MBTA's workforce consisted of 6,547 employees. By FY 2018, it reached an all-time 4 year-low of 5,643 employees. Recognizing that they cut too close to the bone, the T is slowly regaining the necessary staff needed to provide service and meet its business needs. As of June 30, 2019, the T has 6,198 employees. Another issue that impedes talent acquisition is the lengthy hiring process of more than 100 days. It should be noted that the MBTA is currently working at reducing this timeframe. Recently, as part of a shared service with the Massachusetts Department of Transportation (MASSDOT), the T will utilize Cornerstone, a succession planning and management software tool and begin to build a cadre of leadership talent.

Additionally, in the past year, the MBTA has been extraordinarily successful attracting top talent at the highest levels of the organization from some of the country's finest schools. The SRP

met with the newly hired senior leaders and recognized their energy and passion to meet the challenges that the T currently faces. However, the transit industry is a complicated business. The limited transit experience of the new talent impedes their ability to 'see around corners' in such a complex system. Onboarding concerns will be discussed below in the Internal Communication section.

The agency has not performed well in terms of leading for safety or in utilizing this talent to set a firm foundation to guide the organization's path for safety. There is a lack of clarity and alignment around safety leadership. This new leadership team must recognize that the talents they bring to the table will become of greater value when they go out in the field to listen and learn from the employees who have been part of the T for years.

### Managerial Communication

Each of the focus groups shared their thoughts about the managers who have been working at the T for a while. It was clear to the SRP that existing managers lack the communication skills to create a strong safety culture. Frontline employees feel that their thoughts and ideas are rarely, if ever, sought after, and more often than not, completely dismissed. From the stories shared with the panel, there is a lack of consistent and thoughtful managerial training and development.

However, the T recently began a collaborative management development effort with Roxbury Community College to build managerial skills and talent. The inability of supervisors to give constructive feedback was evident as the participants shared their everyday frustrations on how they were spoken to. The pay inequity to move to a managerial title was also discussed with the operating focus groups. There is no incentive to become a manager since an employee can earn substantially more than his/her supervisor by working overtime. It should be noted that this is an industry-wide issue for many public transit properties.

### Teamwork

Teamwork is constantly talked about in organizational life. It is not just a concept; rather, it is a strategic choice. At the kickoff meeting (July 2019) with the senior leaders, two questions were asked. What is the strength of the T and what do you see as a development opportunity? Most members of the leadership believe that the T's ability to handle crisis is their strength. However, the creation of departmental silos and poor internal communications was most often cited as an area that the organization needs to improve.

Much of the discussion across the six Focus groups also centered on siloes and the lack of communication between leaders, managers, and the frontline. Focus group participants validated their senior leadership concerns, stating that it is hard to hold people accountable because there is a lack of clarity on what people do. In general, they feel that the culture struggles with defining who their internal customer is and that there is a lack of cooperation among departments.

### Internal Communications

Through many individual and focus group discussions, the SRP heard much dismay about the MBTA's lack of onboarding practices for new hires. While HR does conduct the usual benefits and forms completion rituals, new hires from the executive level to the frontline talked about 'fending for themselves' when it came to learning about their role, responsibilities, the T culture, and what it values. By virtue of the roles, frontline employees have a greater exposure to the operations and safety, i.e. they must receive ROW and technical training, which improves their understanding of the organization. However, for employees who are hired in back office functions, the word safety is rarely if ever discussed during those beginning days. In fact, non-operating focus group participants, more often than not, mentioned that safety is really not part of their job since they do not work in the operations.

Additionally, throughout the focus group discussions, facilitators heard employees state that organization charts were non-existent; therefore, they had to create their own charts to gain a better understanding of who works where and what different functions are performed. As a result of inconsistent onboarding practices, new hires have established a creative approach to learning about MBTA. One example is to meet personnel from another department at their location to get a better visual sense and understanding of the operation. The onboarding process in another area that presents the opportunity for benchmarking. Many transit agencies have comprehensive new employee orientation programs that requires employees at all levels to jointly attend.

### Conclusion - Creating a New Normal

In an organization with a healthy culture that supports safety, several attributes will always be visible and center to all actions and challenges. First, at the core would be a stated vision and mission, with clearly defined values and strategies that bring the mission to life. There would also be defined behaviors that would guide all employees to follow. It must be clear that leadership owns culture, and the leadership's daily actions will continue to define the culture. In essence, what they resource, what they emphasize, how they treat employees and customers, and what they celebrate and show value for, far outweighs any written strategies, verbal statements or posters on the wall.

The MBTA is at a critical junction in its history. The Chairman, FMCB and the GM have all acknowledged that the culture of the T must change to meet the needs of its riding public and the employees who move the system. Establishing a culture of safety is not an option, rather, it has become a necessity. They recognize that to move the organization to a place where safety is a priority and is culturally integrated into every aspect of their mission, the leadership team must be clear and aligned on what their goals are, the strategies they need to establish to get there, and determine how they will align themselves to work together to build a new normal—a culture that places safety as a foundational value for its employees and customers all day, every day.

## **X. RECOMMENDATIONS**

The SRP is providing 34 recommendations, which contain 61 individual corrective actions that the Panel believes will set the agency on the path toward implementing a more effective SMS approach to safety and decrease the frequency and severity of organizational accidents.

SMS Discussion:

**Issue:** The MBTA is experiencing a number of accidents and operational incidents, which can be directly attributed to their current SMS practices not achieving effective outcomes.

| <b>Safety Policy Findings</b>  | <b>Safety Policy Recommendations</b>  | <b>Page</b>  |
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| <p><u>Safety Policy Finding 1:</u> MBTA management does not have defined safety objectives, safety performance targets and safety performance indicators. This circumstance has made executive leadership and the FMCB “blind” to organizational risk.</p> <p>Effective PMI programs, as well as QA/QC activities, are the agency’s primary defenses against operational incidents. Intense concentration on these activities should be one of the central focuses of an accident investigation. More importantly, simply performing required PMIs and having effective QA/QC programs will dramatically reduce operational incidents.</p> | <p><u>Safety Policy Recommendation 1a:</u> MBTA management must establish safety objectives, safety performance targets and safety performance indicators. These metrics should include both operations and safety targets, i.e. derailments, collision, efficiency testing, training, employee and customer injury data as well as compliance rates with PMIs activities for each department and other key performance data as determined by senior management.</p> <p><u>Safety Policy Recommendation 1b:</u> The establishment of PMI safety performance targets and safety performance indicators must ensure that these activities:</p> <ul style="list-style-type: none"> <li>• are aligned with industry best practices,</li> <li>• are occurring at the required frequency</li> <li>• are monitored to ensure they have not been inappropriately suspended or discontinued,</li> <li>• are monitored to ensure required mid-life or other critical system overhauls are conducted,</li> <li>• have sufficient human capital to be carried out,</li> <li>• are properly funded.</li> </ul> <p><u>SMS Safety Policy Recommendation 1c:</u> Once the above metrics are established, the safety objectives, performance targets and indicators must be formally communicated by MBTA management throughout the agency (as appropriate), reviewed and periodically updated, and used to inform the allocation of resources.</p> <p><u>SMS Safety Policy Recommendation 1d:</u> MBTA must establish effective organization-wide QA/QC programs.</p> | <p>4-6<br/>8, 11,<br/>12-13,<br/>14, 23,<br/>26, 27,<br/>30,</p> |
| <p><u>Safety Policy Finding 2:</u> A select portion of PMIs activities</p>   | <p><u>Safety Policy Recommendation 2:</u> MBTA management must identify and correct all areas where deferred maintenance is occurring.</p>  | <p>5</p>   |

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| <p>were intentionally suspended on the transit side of the agency.</p>   |  |                  |
| <p><u>Safety Policy Finding 3:</u> There is little or no data to support what PMIs are required, or what has been accomplished.</p>  | <p><u>Safety Policy Recommendation 3:</u> MBTA management must ensure that sufficient resources are directed toward expediting the implementation of data collection systems, to include, but not be limited to all MOW departments, training and medical departments.</p>   | <p>4, 5, 10,</p> |
| <p><u>Safety Policy Finding 4:</u> Keolis is performing well. The Panel attributes this higher level of performance to the structure provided by FRA regulations.</p>  | <p><u>Safety Policy Recommendation 4:</u> MBTA should evaluate adopting FRA standards on the transit side of the operation, where appropriate, to provide guidance the workforce and ensure accepted industry minimum standards are followed.</p>  | <p>5-6</p>       |
| <p><u>Safety Policy Finding 5:</u> Individuals on the FMCB, individuals in MBTA executive leadership roles and many senior leaders do not have “hands-on” transit operations and safety experience, which are the core functions of the organization.</p>  | <p><u>Safety Policy Recommendation 5a:</u> MBTA must provide direct mentoring and coaching to individuals in executive leadership roles to make them more effective.</p> <p><u>Safety Policy Recommendation 5b:</u> MBTA must build a leadership team that contains seasoned transit professionals with operations and safety expertise and experience.</p> <p><u>Safety Policy Recommendation 5c:</u> The FMCB should evaluate adding individuals with operations and safety skillsets to their ranks to provide a more holistic approach to overseeing the MBTA.</p> | <p>7, 26</p>     |
| <p><u>Safety Policy Finding 6:</u> The leadership on the mass transit side of the house, appears to be extremely distracted by preparing for FMCB meetings, which are mandated to occur 36 times a year. This dynamic is clearly affecting the operational and safety performance of the organization.</p> | <p><u>Safety Policy Recommendation 6:</u> MBTA and FMCB leaders should take measures to reduce the required frequency of Board meetings, i.e. petition the MA. legislature for relief. If this is not feasible, identify other methods of making the meetings less burdensome on senior MBTA staff.</p>  | <p>6, 34</p>     |

| <b>Safety Risk Management Findings</b>  | <b>Safety Risk Management Recommendations</b>   | <b>Page</b>                      |
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| <p><u>Safety Risk Management Finding 1:</u> The CAPs being produced by MBTA transit management are not achieving the level of safety improvement needed at the organization.</p>  | <p><u>Safety Risk Management Recommendation 1:</u> The agency should formally adopt the recommendations made in this report and track them to closure.</p>  | <p>8, 11</p>                     |
| <p><u>Safety Risk Management Finding 2:</u> The rapid closure of CAP action items does not provide sufficient time for staff to monitor that these activities are being repetitively performed. In addition, the CAPs are not being sufficiently audited and analyzed to evaluate whether they are effective.</p> <p>CAPs that are not achieving the intended outcomes are not being sent back through the Safety Risk Management process to be re-evaluated and revised.</p> | <p><u>Safety Risk Management Recommendation 2a:</u> The Safety department should evaluate recently “closed” CAPs to determine if they were prematurely closed without a sufficient level of verification and auditing.</p> <p><u>Safety Risk Management Recommendation 2b:</u> Once the analysis described above is completed, determine if any CAPs need to be reopened, revised and reissued.</p> <p><u>Safety Risk Management Recommendation 2c:</u> MBTA should evaluate and revise their current CAP procedures to ensure that it:</p> <ul style="list-style-type: none"> <li>• requires data analysis over a sufficient period of time to verify implementation and that required actions are occurring on an ongoing basis</li> <li>• perform data analysis to determine if additional actions are required</li> <li>• audits the results of the mitigation to confirm that the desired results are being achieved</li> <li>• re-evaluate mitigations, if positive results are not achieved</li> <li>• defines the global strategy for addressing the specific risk at the agency</li> <li>• ensures that CAPs are not closed until all elements are satisfied.</li> </ul> | <p>9-10<br/>15</p>               |
| <p><u>Safety Risk Management Finding 3:</u> MBTA is insular and does not optimally take advantage of benchmarking opportunities.</p>  | <p><u>Safety Risk Management Finding 3a:</u> MBTA should benchmark their existing practices to include, but be limited to, rule compliance testing programs, employee safety reporting systems, accident investigations, PMIs, QA/QC activities and ROW/RWP training. This can be achieved via peer-to-peer discussions, comparison to FRA regulations and APTA peer reviews as some examples.</p>  | <p>5, 10,<br/>23, 26,<br/>36</p> |

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|  | <p><u>Safety Risk Management Finding 3b</u>: MBTA must adopt and implement best practices identified via benchmarking activities.</p>   |       |
| <p><u>Safety Risk Management Finding 3</u>: Contractors performing safety sensitive functions, such as operating work equipment rail vehicles, are not part of Transit’s Fatigue Risk Management Program.</p> <p>Keolis lacks an OSA screening program.</p>  | <p><u>Safety Risk Management Recommendation 4a</u>: MBTA should evaluate requiring contractors, who perform safety sensitive functions such as operating work equipment, to comply with the T’s FRMP standards.</p> <p><u>Safety Risk Management Recommendation 4b</u>: MBTA must ensure that the OSA screening program and other appropriate measures to combat fatigue on the commuter rail operation are implemented.</p>  | 11    |
| <p><u>Safety Risk Management Finding 4</u>: Many recent incidents had vehicle and track related defects as causal factors in these events. Therefore, the Panel requested third-party SMEs perform an assessment.</p> <p>There may be other key legacy assets that should be independently evaluated to determine their functionality such as Fire/Life/Safety, Ventilation and Drainage assets.</p> | <p><u>Safety Risk Management Recommendation 5a</u>: MBTA management must evaluate and implement as appropriate, the findings of the third-party consultants assessing the Track and Vehicle maintenance areas, with immediate emphasis on QA/QC functions.</p> <p><u>Safety Risk Management Recommendation 5b</u>: MBTA shall ensure that the appropriate level of resources are made available to correct the defects identified by the external SMEs in a timely manner.</p> <p><u>Safety Risk Management Recommendation 5c</u>: MBTA must evaluate if other key legacy asset system need third-party SME inspections, such as Fire/Life/Safety, Ventilation and Drainage assets.</p> | 11-14 |
| <p><u>Safety Risk Management Finding 5</u>: The SRP believes that there is reluctance on the part of vehicle maintenance personnel to continue putting the needed level of resources into maintaining the older fleet of cars, as they are scheduled to be retired in the near future.</p>   | <p><u>Safety Risk Management Recommendation 6</u>: MBTA must continue to maintain rail cars to agency standards as long as the vehicles are used in passenger service.</p>  | 12    |

| <b>Safety Assurance Findings</b>   | <b>Safety Assurance Recommendations</b>  | <b>Page</b>                      |
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| <p><u>Safety Assurance Finding 1:</u><br/>           MBTA operations and safety management do not have a sufficient presence in the field; therefore, they are not adequately monitoring regular operations.</p>   | <p><u>Safety Assurance Recommendation 1:</u> MBTA executive management should establish methods to increase opportunities for leadership to spend more time in the field, i.e. “No meetings days”, joint management &amp; union audits, performance reviews with managerial engagements with frontline employees as a metric, mandate weekly field time for all managers and supervisors.</p>  | <p>15-18</p>                     |
| <p><u>Safety Assurance Finding 2:</u><br/>           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.</p>   | <p><u>Safety Assurance Recommendation 2a:</u> MBTA management should evaluate adopting a third party employee safety reporting system, i.e. C<sup>3</sup>RS or the BTS system.</p> <p><u>Safety Assurance Recommendation 2b:</u> MBTA management must actively encourage employees to report safety concerns and promote existing and future employee safety reporting systems.</p> <p><u>Safety Assurance Recommendation 2c:</u> MBTA management must implement mechanisms to provide feedback to employees on actions that have been taking in response to reported safety concerns.</p> | <p>6, 18, 19, 21, 22, 26, 34</p> |
| <p><u>Safety Assurance Finding 3:</u><br/>           The Safety department cannot lead an independent, comprehensive accident investigation due to a lack of Subject Matter Experts. This inadequacy is even more pronounced for events centered around Mechanical &amp; Engineering issues.</p> | <p><u>Safety Assurance Recommendation 3:</u> The Safety department is pursuing resources to address the SME finding. The Safety department must provide executive leadership with periodic updates on this activity (headcount and ZBB issues will be discussed in the Financial recommendation section).</p>  | <p>19-23</p>                     |
| <p><u>Safety Assurance Finding 4:</u><br/>           Design modifications have occurred without regimented safety certification being conducted. This circumstance is due to the operating departments not involving the Safety department in day-to-day activities.</p>                         | <p><u>Safety Assurance Recommendation 4:</u> MBTA management must ensure that all management is aware of safety certification requirements. This can be achieved via SMS training, operational bulletins, and “Lessons Learned” bulletins, as some examples.</p>   | <p>22</p>                        |

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| <p><u>Safety Assurance Finding 5:</u><br/>There does not appear to be clear lines of supervision for motor-persons.</p> <p>It is not evident that “ride checks” that gauge the caliber of employee’s performance is being conducted on motor-persons. This action is especially critical for new motor-persons.</p> <p>Motor-person training should be evaluated to ensure employees fully understand the requirements of their job as well as the consequences of their actions.</p> | <p><u>Safety Assurance Recommendation 5a:</u> MBTA management must establish clear lines of reporting for motor-persons and their immediate supervisors.</p> <p><u>Safety Assurance Recommendation 5b:</u> MBTA management must establish a defined frequency for motor-person read checks and give feedback to employees.</p> <p><u>Safety Assurance Recommendation 5c:</u> MBTA management must establish and monitor safety performance and safety performance indicators for this activity.</p> <p><u>Safety Assurance Recommendation 5d:</u> MBTA management must evaluate the current Motor-person training to ensure employees are adequately trained on their duties and understand the consequences of their actions, such as over-speeding as one example.</p> | <p>15</p> |
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| <b>Safety Promotion Findings</b>   | <b>Safety Promotion Recommendations</b>  | <b>Page</b>  |
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| <p><u>Safety Promotion Finding 1:</u><br/>The MBTA transit training function is decentralized which creates internal oversight issues regarding assessing the consistency and caliber of the training that is being delivered.</p>     | <p><u>Safety Promotion Recommendation 1:</u> MBTA must evaluate centralizing training to ensure consistency and caliber of training being delivered.</p>   | <p>23-24</p> |
| <p><u>Safety Promotion Finding 2:</u><br/>The volume of students attending RWP training created time management challenges for the instructor, which resulted in key training areas being glossed over or were not covered at all.</p> | <p><u>Safety Promotion Recommendation 2:</u> Training management must establish and enforce manageable maximum class sizes (issues regarding headcounts and ZBB will be covered in the Financial recommendations below).</p> | <p>24</p>    |
| <p><u>Safety Promotion Finding 3:</u></p>  | <p><u>Safety Promotion Recommendation 3:</u> MBTA Training management should routinely audit training</p>  | <p>24-25</p> |

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| <p>The instructor wrote the 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.</p> <p>The speed in which critical material was covered raises concerns that novices to the transit industry may not have absorbed enough working knowledge to recognize a ROW procedural error or that they will have the confidence to invoke a Good Faith Challenge.</p> | <p>classes to be aware of and identify these types of deviations in training protocols and develop CAPs to address.</p>   |       |
| <p><u>Safety Promotion Finding 4:</u><br/>Training manuals are printed in Black and White; however, the different colored flags in the curriculum are not labeled by color.</p>  | <p><u>Safety Promotion Recommendation 4:</u> MBTA must either resume printing color training manuals or update the current manuals to provide color coded labeling where applicable.</p>  | 25    |
| <p><u>Safety Promotion Finding 5:</u><br/>There does not appear to be clearly defined PPE standards that are understood across the organization.</p>   | <p><u>Safety Promotion Recommendation 5a:</u> MBTA needs to define their minimum standards for ROW PPE, communicate the standards to the workforce and enforce them.</p> <p><u>Safety Promotion Recommendation 5b:</u> MBTA needs to perform a critical assessment of employee safety needs beyond ROW PPE, i.e. harnesses for fall protection, PPE for Hot Work, as some examples.</p> | 25    |
| <p><u>Safety Promotion Finding 6:</u><br/>While the MBTA is making progress in implementing SMS, there is clearly a need for further improvement in the many areas described throughout this report.</p>   | <p><u>Safety Promotion Recommendation 6a:</u> MBTA must conduct an organization-wide SMS gap analysis to determine the agency's current SMS maturity level.</p> <p><u>Safety Promotion Recommendation 6b:</u> The SMS gap analysis of the Safety department should receive</p>  | 27-28 |

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|  | priority as they are instrumental in the implementation of the agency’s SMS program. |  |
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Financial Review Discussion:

**Issue:** 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 PMIs and maintaining the full functionality of legacy assets.

| <b>Financial Review Findings</b>   | <b>Financial Review Recommendations</b>   | <b>Page</b>        |
|--|---|--------------------|
| <p><u>Financial Review Finding 1:</u><br/>The FMCB strategic plan is overly focused on delivering the Capital budget. While the plan mentions that “asset management and life-cycle maintenance are the keys to ensuring that the MBTA’s asset never again fall into disrepair”, there are no metrics measuring the performance of preventative maintenance.</p> | <p><u>Financial Review Recommendation 1:</u> FMCB must require MBTA leadership to provide and publicly report on KPIs associated with PMIs and the performance of required maintenance of legacy system assets to keep them fully functional.</p>   | 14, 26, 30, 32, 33 |
| <p><u>Financial Review Finding 2:</u><br/>Deep budget reductions have resulted in the lack of resources in critical areas, which may be affecting the safe delivery of services.</p> <p>The reductions appear to have occurred as a totally top down approach without a critical or clear assessment of functions or needs.</p>                                  | <p><u>Financial Review Recommendation 2a:</u> MBTA must perform a 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.</p> <p><u>Financial Review Recommendation 2b:</u> MBTA must avoid a top down approach to conducting the ZBB and have an inclusive dialogue with those directly impacted by these decisions.</p> | 24, 31             |
| <p><u>Financial Review Finding 3:</u><br/>A key priority of the FMCB has been acceleration of capital delivery.</p> <p>This is a major initiative that has a significant impact upon the operating budget. There</p>   | <p><u>Financial Review Recommendation 3:</u> MBTA must re-examine the financial process to provide efficiencies and flexibility to address the needs of daily operations and the capital spending.</p>  | 29, 32             |

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| <p>is widespread concern about the resource focus on capital delivery is occurring at the expense of the operating needs.</p> |  |  |
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Safety Culture Discussion:

**Issue:** The present leadership team is not providing the clarity and alignment necessary to build a new safety culture at the MBTA.

| <b>Safety Culture Findings</b>   | <b>Safety Culture Recommendations</b>  | <b>Page</b>                     |
|--|--|---------------------------------|
| <p><u>Safety Culture Finding 1:</u> The agency has not performed well in terms of leading for safety or in utilizing its internal talent to set a firm foundation to guide the organization’s path for safety.</p> <p>There is a lack of clarity and alignment around safety leadership.</p> | <p><u>Safety Culture Recommendation 1a:</u> 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.</p> <p><u>Safety Culture Recommendation 1b:</u> MBTA must update managerial job descriptions to include performance criteria to create ownership and accountability for driving a culture of safety.</p> <p><u>Safety Culture Recommendation 1c:</u> MBTA must create a feedback loop for discussing performance around safety.</p> <p><u>Safety Culture Recommendation 1d:</u> MBTA must define leadership safety involvement and expectations.</p> <p><u>Safety Culture Recommendation 1e:</u> MBTA must hold monthly Executive Safety meetings at the executive level and cascade information down through the organization.</p> | <p>3, 4, 27, 29, 33, 34, 35</p> |
| <p><u>Safety Culture Finding 2:</u> The absence of trust and respect, insufficient communications, an increased silo mentality resulting in poor teamwork, coupled with inadequately trained leaders are at the core of the T’s poor safety performance and low morale.</p>                  | <p><u>Safety Culture Recommendation 2a:</u> MBTA must utilize its affiliation with Roxbury Community College to train managers to its fullest.</p> <p><u>Safety Culture Recommendation 2b:</u> Establish feedback mechanisms that help leaders learn effective communication skills. Provide one on one and/or team coaching to guide leaders.</p>   | <p>6, 7, 19, 26, 33, 34, 36</p> |

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| <p>Managers and supervisors need to improve basic leadership skills.</p> <p>Leaders do not spend enough time in the field engaging with frontline personnel. And when they do, they exhibit poor listening and feedback skills.</p> |  |   |
| <p><u>Safety Culture Finding 3:</u><br/>From senior management to the frontline—the agency has created a silo mentality and does not seek or share information to achieve its goals.</p>  | <p><u>Safety Culture Recommendation 3</u> MBTA needs to create cross-functional teams with specific goals to achieve strategic plans and breakdown siloes.</p>   | <p>6, 33, 36</p>                          |
| <p><u>Safety Culture Finding 4:</u><br/>There is not an adequate onboarding process from both the organizational and departmental level.</p>  | <p><u>Safety Culture Recommendation 4a:</u> MBTA must benchmark its onboarding process against other transit agencies.</p> <p><u>Safety Culture Recommendation 4b:</u> MBTA must create an onboarding program for both operating and support functions. The onboarding process should include safety information that will guide new hire understanding of safety as a value by clarifying its importance in every aspect of MBTA business.</p> <p><u>Safety Culture Recommendation 4b:</u> 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.</p> | <p>4, 35, 36</p>                          |
| <p><u>Safety Culture Finding 5:</u> The MBTA lacks formal organization charts.</p>  | <p><u>Safety Culture Recommendation 5:</u> MBTA needs to build and continuously update organization charts to help employees learn who, what and how the organization achieves its daily mission.</p>  | <p>31, 36</p>                             |
| <p><u>Safety Culture Finding 6:</u><br/>The agency lacks a multi-vehicle approach to communicating with employees.</p>  | <p><u>Safety Culture Recommendation 6a:</u> MBTA must look at and implement a diverse strategies to communicate with its employees to build “esprit de corps”.</p>   | <p>4, 6-7, 26, 27, 31, 33, 34, 35, 36</p> |

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|  | <u>Safety Culture Recommendation 6b:</u> MBTA should create events that make employees feel appreciated and valued.  |    |
| <u>Safety Culture Finding 7:</u><br>There is no incentive to become a manager since an employee can earn substantially more than his/her supervisor by working overtime.   | <u>Safety Culture Recommendation 7:</u> MBTA must conduct an equity analysis to attract and retain quality management and non-operations personnel, such as Safety Officers.       | 36 |
| <u>Safety Culture Finding 8:</u><br>The MBTA is at a critical junction in its history. The Chairman, FMCB and the GM have all acknowledged that the culture of the T must change to meet the needs of its riding public and the employees who move the system. Establishing a culture of safety is not an option, rather, it has become a necessity. | <u>Safety Culture Recommendation 8:</u> MBTA should evaluate inviting the SRP back after a period of time has elapsed to gauge the progress of implementing these recommendations. | 37 |

## **Appendix A**

### **Safety Review Panel Biographies**

#### **Ray LaHood**

Ray LaHood is a former U.S. Department of Transportation Secretary.

With a 36-year career in public service, Secretary LaHood has extensive experience on major national policy issues, among them transportation and infrastructure. He served as the 16<sup>th</sup> Department of Transportation Secretary from 2009 to 2013 and quickly became known as a bipartisan leader and skilled conciliator in a highly partisan environment.

Secretary LaHood's tenure was marked by landmark effort to improve safety in every mode of transportation, from aviation and rail to pipelines and automobiles. Under his leadership, improvements to America's infrastructure included building or replacing 350,000 miles of highway, repairing 20,000 bridges and renewing or constructing 6,000 miles of rail track. Secretary LaHood also achieved more stringent fuel efficiency requirements from automakers, took steps to address airline pilot fatigue and turned the problem of distracted driving into a national concern. As Secretary of Transportation, he oversaw an agency with more than 55,000 employees and a US\$70 billion budget in charge of air, maritime, and surface transportation.

Before heading the US Department of Transportation, Secretary LaHood served from 1995 to 2009 in the US House of Representatives on behalf of the 18<sup>th</sup> District of Illinois and also served on various House committees, among them the powerful House Appropriations Committee and the House Intelligence Committee. He served as chief of staff to US House Minority Leader Robert Michel from 1982 to 1994. He was director of Rock Island County Youth Service Bureau from 1972 to 1974; chief planner of the Bi-States Metropolitan Planning Commission from 1974 to 1977; and district administrative assistant for US Congressman Tom Railsback from 1977 to 1982.



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Professional Biography  
Carolyn Flowers, Managing Principal, InfraStrategies LLC

## CAROLYN FLOWERS

Carolyn Flowers joined InfraStrategies LLC as Managing Principal in February 2019. InfraStrategies is a global consultancy providing advisory, advocacy and management services to public authorities and private organizations in the infrastructure space.

Carolyn's prior role was as Senior Vice President, Americas Transit Market Sector Leader at AECOM with the responsibility for client and industry relations and coordinating business development in United States and Canada. Prior to that Carolyn spent two years at the Federal Transit Administration as Senior Advisor and in the last nine months of her tenure she served as the Acting Administrator. From 2010 to 2015 she served as Chief Executive Officer/Director of Public Transit for Charlotte Area Transit System (CATS), with responsibility for county-wide bus and rail transit planning and management.

Prior to joining the City of Charlotte, Flowers was Chief Operations Officer for Los Angeles County Metropolitan Transportation Authority (MTA) and responsible for managing bus operations and Freeway Service Patrol. In all, she spent nineteen years at MTA in a number of positions in budget and operations. She received a bachelor's degree in History and Political Science and a master's degree in Business Administration from the University of California, Los Angeles (UCLA) School of Management.

Flowers is currently serving on the American Public Transportation Association's (APTA) Board of Directors. She previously served as Co-Chair Reauthorization Task Force. She is a member of APTA's Publication Advisory, Leadership, Legislative, and Awards committees. She also served on the Board of Directors for the North American Transit Services Association (NATSA) and the Transit Cooperative Research Program (TCRP) Oversight and Project Selection. She is also serving on the Board of the Women's Transportation Seminar and the Eno Foundation. In addition, she is a member of Conference of Minority Transportation Officials (COMTO).

In 2007, she was recognized as the Tom Bradley Alumnus of the Year by the UCLA Black Alumni Association. The award is named for the first African-American Mayor of Los Angeles, a champion of public transportation for Los Angeles County. In 2008, she was named Woman of the Year by the Los Angeles Chapter of the Women's Transportation Seminar. She also received the Ambassador award for her volunteer work with the American Stroke Association and was given a special recognition award by the Greater Los Angeles African-American Chamber of Commerce. She was named by UCLA Anderson School of Business as one of 75 most inspirational graduates in their first 100 years. She was also 2018 recipient of the Friends of Eno Award from the Eno Foundation.

Flowers is a graduate of the 2003 APTA Transportation Leadership Class. She participated in a 2005 international study project for the National Association of Sciences, sponsored by the Eno Foundation for Transportation Studies, as well as the executive development program sponsored by the Eno Center for Transit Leadership. She has served on Johnson C. Smith University Board of Visitors, the Foundation for the Carolinas Charlotte-Mecklenburg Fund Board of Directors, the Institute for Transportation Research and Education (ITRE) Board and the Women's Intercultural Exchange (WIE) Advisory Council.



## **Carmen Bianco**

Carmen Bianco is the principal at Bianco Associates. His work on organizational culture and business performance spans the globe.

For nearly six years, Carmen Bianco oversaw the operation of New York City Transit, North America's largest mass transit system.

As president of the subway and bus systems, he was responsible for the safe and efficient transportation of New York City Transit's nearly eight million daily customers. Bianco directed a workforce of more than 48,000 employees and an annual operating budget that exceeded \$10 billion.

During his tenure, Bianco transformed the agency's organizational culture to align management strategies, enhance safety and improve customer service to advance the subways, buses, paratransit and Staten Island Railway in New York City.

Bianco and his team guided the agency through significant snowstorms, Hurricane Irene and Superstorm Sandy, which took a critical toll on significant areas of the 110-year-old infrastructure. Despite more than \$4 billion in Sandy-related damage, Bianco and his team restored 80 percent of subway service within five days.

As New York City Transit worked to deliver consistent service to daily ridership that has steadily expanded to more than 8.2 million people, Bianco lead his team to plan service for the future by evaluating ways to deliver higher-capacity, more environmentally friendly and technologically advanced trains and buses and improved levels of customer service.

Bianco joined NYCT with 33 years of experience in corporate safety, loss control and transportation operations. He worked in key leadership positions at Amtrak for more than 17 years and served as New York City Transit's assistant vice president of system safety between 1991-1995.

For a decade, Bianco worked with DuPont and BST, two of the most highly sought consulting firms, advising international business leaders from Fortune 100 and 500 firms on organizational culture change to support operational excellence.

In his consulting, Carmen advises corporations on issues involving leadership, culture, strategy and operational practices. In addition to being an advisor to several CEOs, Carmen has an extensive list of senior executives who continue to use his skills and experiences as a senior executive and professional coach.

## Appendix B

### Safety Management System General Requirements

#### SMS General requirements

49 CFR Part 673 requires that each transit agency must establish and implement a SMS. A transit agency SMS must be appropriately scaled to the size, scope and complexity of transit agency and include the following elements:

Safety Policy  
Safety Risk Management  
Safety Assurance  
Safety Promotion

#### Safety Policy

- A transit agency must establish its organizational accountabilities and responsibilities and have a written statement of safety management policy that includes the agency's safety objectives and safety performance targets.
- A transit agency must establish a process that allows employees to report safety conditions to senior management, protections for employees who report safety conditions to senior management, and a description of employee behaviors that may result in disciplinary action.
- The safety management policy must be communicated throughout the agency's organization.
- The transit agency must establish the necessary authorities, accountabilities, and responsibilities for the management of safety amongst the following individuals within its organization, as they relate to the development and management of the transit agency's SMS:
  - *Accountable Executive.* The transit agency must identify an Accountable Executive. The Accountable Executive is accountable for ensuring that the agency's SMS is effectively implemented, throughout the agency's public transportation system. The Accountable Executive is accountable for ensuring action is taken, as necessary, to address substandard performance in the agency's SMS. The Accountable Executive may delegate specific responsibilities, but the ultimate accountability for the transit agency's safety performance cannot be delegated and always rests with the Accountable Executive.
  - *Chief Safety Officer or SMS Executive.* The Accountable Executive may designate a Chief Safety Officer or SMS Executive who may be given authority and responsibility for day-to-day implementation and operation of an agency's SMS. The Chief Safety Officer or SMS Executive must hold a direct line of reporting to the Accountable Executive. A transit agency may allow the Accountable Executive to also serve as the Chief Safety Officer or SMS Executive.

- *Agency leadership and executive management.* A transit agency must identify those members of its leadership or executive management, other than an Accountable Executive, Safety Officer, or SMS Executive, who have authorities or responsibilities for day-to-day implementation and operation of an agency's SMS.
- *Key staff.* A transit agency may designate key staff, groups of staff, or committees to support the Accountable Executive, Chief Safety Officer, or SMS Executive in developing, implementing, and operating the agency's SMS.

### Safety Risk Management

- *Safety Risk Management process.* A transit agency must develop and implement a Safety Risk Management process for all elements of its public transportation system. The Safety Risk Management process must be comprised of the following activities: Identification of safety hazards, analysis of safety hazards, safety risk evaluation, and safety risk mitigation.
- *Safety hazard identification and analysis.*
  1. A transit agency must establish a process for hazard identification and analysis.
  2. A transit agency must include, as a source for hazard identification and analysis, data, and information provided by an oversight authority and the FTA.
- *Safety risk evaluation and mitigation.*
  - A transit agency must establish activities to evaluate and prioritize the safety risk associated with the potential consequences of safety hazards. Safety risks must be evaluated in terms of probability and severity and take into account mitigations already in place to reduce the probability or severity of the potential consequence(s) analyzed.
  - A transit agency must establish criteria for the development of safety risk mitigations that are necessary based on the results of the agency's safety risk evaluation.

### Safety Assurance

- *Safety assurance process.* A transit agency must develop and implement a safety assurance process, consistent with this subpart.
- *Safety performance monitoring and measurement.* A transit agency must establish activities to:
  - Monitor its system for compliance with, and sufficiency of, the agency's procedures for operations and maintenance;
  - Monitor its operations to identify hazards not identified through the Safety Risk Management process.
  - Monitor its operations to identify any safety risk mitigations that may be ineffective, inappropriate, or were not implemented as intended;
  - Investigate safety events to identify causal factors; and
  - Monitor information reported through any internal safety reporting programs.

- *Management of change.*
  - A transit agency must establish a process for identifying and assessing changes that may introduce new hazards or impact the transit agency's safety performance.
  - If a transit agency determines that a change may impact its safety performance, then the transit agency must evaluate the proposed change through its Safety Risk Management process.
- *Continuous improvement.*
  - A transit agency must establish a process to assess its safety performance.
  - If a transit agency identifies any deficiencies as part of its safety performance assessment, then the transit agency must develop and carry out, under the direction of the Accountable Executive, a plan to address the identified safety deficiencies.

### Safety Promotion

- *Competencies and training.* A transit agency must establish a comprehensive safety training program for all agency employees and contractors directly responsible for the management of safety in the agency's public transportation system. The training program must include refresher training, as necessary.
- *Safety communication.* A transit agency must communicate safety and safety performance information throughout the agency's organization that, at a minimum, conveys information on hazards and safety risks relevant to employees' roles and responsibilities and informs employees of safety actions taken in response to reports submitted through an employee safety reporting program.

## Appendix C

### List of Interviewees

| <b>Position</b>        | <b>Title</b>                                     |
|------------------------|--|
| FMCB Members           | FMCB Chair                                       |
| FMCB Members           | FMCB Vice Chair                                  |
| FMCB Members           | FMCB Member                                      |
| FMCB Members           | FMCB Member                                      |
| Mass. Dept of Trans    | Secretary of Transportation                      |
| MBTA Senior Leadership | General Manager                                  |
| MBTA Senior Leadership | Deputy General Manager                           |
| MBTA Senior Leadership | Chief of Staff (GM)                              |
| MBTA Senior Leadership | Chief of Operations Strategy, Policy & Oversight |
| MBTA Senior Leadership | Chief Railroad Officer                           |
| MBTA Senior Leadership | Chief Safety Officer                             |
| MBTA Senior Leadership | Green Line Extension Program Manager             |
| MBTA Senior Leadership | Executive Director of Commuter Rail              |
| MBTA Senior Leadership | Chief of Staff (DGM)                             |
| MBTA Senior Leadership | Chief Operations Officer                         |
| MBTA Senior Leadership | Chief Counsel                                    |
| MBTA Senior Leadership | Assistant GM - Capital Delivery                  |
| MBTA Senior Leadership | Chief Customer Officer                           |
| MBTA Senior Leadership | AGM for Strategic Initiatives                    |
| MBTA Senior Leadership | Chief of Capital Programs                        |
| MBTA Senior Leadership | Assistant General Manager for Policy             |
| MBTA Senior Leadership | Chief Administration Officer                     |
| MBTA Senior Leadership | Chief of Green Line Transformation               |
| MBTA Senior Leadership | Director, Communications and Public Affairs      |
| MBTA Senior Leadership | Chief Environmental, Health & Safety Officer     |
| MBTA Senior Leadership | AGM - C/R and Ferry Ops, RR Operations           |
| MBTA Senior Leadership | Chief Human Resource Officer                     |
| MBTA Senior Leadership | Chief Engineering Officer                        |
| MBTA Senior Leadership | Project Manager, South Coast Rail                |
| MBTA Senior Leadership | Dep Dir of Policy & Strategic Planning           |
| MBTA Senior Leadership | Chief Information Officer                        |
| MBTA Management        | Deputy Director of Commuter Rail Safety          |
| MBTA Management        | Director of Asset Management                     |
| MBTA Management        | Deputy CFO                                       |
| MBTA Management        | Director of Risk Management                      |

|                      |  |
|----------------------|--|
| MBTA Management      | Sr. Director of E&M                                      |
| MBTA Management      | Chief Mechanical Officer                                 |
| MBTA Management      | Director - Maintenance of Way                            |
| MBTA Management      | AGM of Rail Operations                                   |
| MBTA Management      | Deputy Director MOW                                      |
| MBTA Management      | Director of Signals and Communications                   |
| MBTA Management      | Dep Dir. of Safety Engineering -<br>Infrastructure       |
| MBTA Management      | Dep Dir. of Safety Engineering -Systems                  |
| MBTA Management      | Dep Dir. of Safety Oversight & Planning                  |
| MBTA Management      | System Safety Specialist                                 |
| MBTA Management      | Safety Analyst   |
| MBTA Management      | Dep Dir. of Transportation Safety                        |
| MBTA Management      | Safety Analyst   |
| MBTA Management      | System Safety Specialist                                 |
| MBTA Management      | Dep Dir. of Occupational Health & Safety                 |
| MBTA Management      | Division Chief, Operations Control Center                |
| MBTA Management      | Deputy Director of Human Resources                       |
| MBTA Management      | Dir Occupational Health Services                         |
| MBTA Management      | Chief Procurement and Contract<br>Administration Officer |
| MBTA Management      | Director of Capital Execution Strategy                   |
| MBTA Management      | Deputy AGM Capital Delivery                              |
| MBTA Management      | Capital Program Oversight                                |
| MBTA Management      | Director Railroad Operations                             |
| MBTA Management      | Section Chief Railroad Operations                        |
| MBTA Management      | Superintendent Subway Main Repair<br>Facility            |
| MBTA Management      | Deputy Directory, Heavy Rail Maintenance                 |
| MBTA Management      | Superintendent of Light Rail Maintenance                 |
| MBTA Management      | Superintendent Blue Line                                 |
| MBTA Management      | Technical Project Manager                                |
| MBTA Management      | Deputy Director of Everett Shops                         |
| MBTA Management      | Deputy Chief Mechanical Officer                          |
| MBTA Management      | Engineer   |
| MBTA Management      | Technical Project Manager                                |
| MBTA Management      | Deputy Director of Engineering                           |
| Administrative Staff | Manager of Staffing                                      |
| Administrative Staff | Director of Labor Operations                             |
| Administrative Staff | Director of Parking                                      |
| Administrative Staff | Deputy Director, Budget-Operating                        |
| Administrative Staff | Assistant Supervisor                                     |
| Administrative Staff | Director of Realtime Applications                        |
| Administrative Staff | Senior Director of Real Estate                           |

Administrative Staff  
Administrative Staff  
Administrative Staff  
Administrative Staff  
Administrative Staff  
Administrative Staff  
Administrative Staff

Deputy Chief Real Estate Officer  
Deputy Dir of Parking Operations  
Senior Labor Counsel  
Labor Counsel  
Director of Accounting  
Budget Analyst  
HR Manager, Special Projects  
Director of Inventory Management

Supervision  
Supervision

Supervisor of Transportation  
Supervisor of Transportation  
Blue Line Signal Supervisor  
Red Line Track Supervisor  
Supervisor- Power Systems & Equipment  
Supervisor – Building Trades  
Supervisor, Ops Control Center  
Chief Inspector Green Line  
Heavy Rail Dispatcher OCC  
Light Rail Dispatcher OCC  
Yard Master Orange Line  
Senior Director - Warehouse & Inventory Management

Frontline Employee  
Frontline Employee

Motor person Blue Line  
Inspector Orange Line  
Streetcar Motor person Green Line  
Train Starter Orange Line  
Motor person Orange Line  
Inspector Orange Line  
Streetcar Motor person Green Line  
Inspector Green Line  
Customer Service Agent Orange Line  
Train Starter Orange Line  
Desk Starter Green Line  
Track Person (inspector)  
Track Person (inspector)  
Motor-person  
Motor-person

Union Leadership  
Local 589

Riverside Car House (Local 589 Barn Captain)  
Cabot Car House (Local 589 Barn Captain)  
Wellington Car House (Local 589 Barn Captain)

Local 589  
Local 589

|                    |  |
|--------------------|--|
| Local 589          | Maintenance of Way Green Line (Local 589<br>Barn Captain)                |
| Local 246          | Local 246 Representative   |
| Local 246          | Local 246 Representative   |
| Local 246          | Local 103 Representative   |
| Local 103          | Local 103 Representative   |
| Local 103          | Local 103 Representative   |
| Local 104          | Foreman day construction - Local 104                                     |
| Local 104          | Sub-station Steward - Local 104  |
| Local 104          | Emergency Crew Steward - Local 104                                       |
| LTK                |  |
| LTK Representative | Vice President   |
| LTK Representative | Deputy PTC Program Manager   |
| LTK Representative | PTC Systems Engineer   |
| LTK Representative | Senior Engineer - PTC Safety   |
| LTK Representative | Senior Consultant  |
| Keolis             |  |
| Keolis Management  | General Manager  |
| Keolis Management  | Locomotive Engineer  |
| Keolis Management  | Dir. of Occupational Safety  |
| Keolis Management  | Vice President, Safety and Security                                      |
| DPU                |  |
| DPU Representative | Director of Transportation Oversight<br>Division                         |
| DPU Representative | Assistant Director of Transportation<br>Oversight Division               |
| FTA                |  |
| FTA Representative | Acting Regional Administrator for Region 1<br>Office                     |
| FTA Representative | Director Office of Program Management and<br>Oversight                   |
| FTA Representative | Deputy Associate Administrator Office of<br>Transit Safety and Oversight |
| FRA                |  |
| FRA Representative | FRA Regional Administrator, Region 1                                     |
| Network Rail       |  |
| NR Representative  | Associate Vice President   |
| NR Representative  | Regional Director, North America   |

HNTB  
HNTB Representative  
HNTB Representative

Project Manager  
Project Manager

CRRC  
CRRC Representative  
CRRC Representative

Interim PM  
System Integration and Test Engineer

STV Inc  
STV Representative

Vice President

## Appendix D

### Focus Group Commentary

Six focus groups were arranged by their various levels within the organization. In addition, back office support functions (Human Resources, Legal, Procurement, Real Estate, Finance, Information Technology, etc.) were in separate groups from employees in operating functions. The make-up of the groups was as follows:

- Transportation/Operations – 3 groups (1 group of supervisors, 2 groups of blended frontline supervisors and hourly employees)
- Support Functions – 2 groups (Human Resources, Legal, Procurement, Real Estate, Finance, Information Technology, etc.)
- Union representatives – 1 group

Each session was 90 minutes in length and had 3 basic rules of conduct. First, what is said in this room, stays in the room. Second, one person speaks at a time, and third, each participant was asked to speak from his/her own perspective. Three to four general questions were asked at each session, as follows:

- How do you perceive the T views Safety? Provide a grade of “A” through “F” and please provide a reason for the grade you give.
- If culture is defined as “How we do things around here”, what does leadership need to do more of, or less of, to build and sustain a healthy organizational culture?
- If the term “engagement” is defined as being actively involved in and dedicated to ones work and the organization. Engaged employees are excited to be a part of it. They are willing to go above and beyond to help the organization succeed. How would you describe your level of engagement with the agency? 1 being least engaged—5 being highly engaged. Please explain your answer.
- If you had 1 wish and you can tell leadership what you would like them to do differently – what would it be?

#### How employees perceive Safety?

- Everything is reactive.
- A well-trained employee is a safer employee. The T can’t get people trained because jobs have to be covered, but we don’t have the people needed to do the work.
- Safety is a joke. We take it more seriously because it is our lives.
- Culture at MBTA? Safety is another disappointment. We walk the track—we walk with our heads down.
- I stopped calling Safety—after the third time I gave up. Now I just go to the customer and tell them to tweet the situation and it gets done. They listen to the customer before their own employees.

## Blame and Retaliation

- The culture is always finding a scapegoat—Who is to Blame?
- I walk on eggshells—lack of trust. I am not even sure who to trust.
- Bring something up—they retaliate.
- Look at our equipment, trains, tracks—they know all about what’s wrong—until it happens to a customer—then they blame whoever is around.

## Perception of Leadership

- Important to make connection with people. The top leaders on down are too busy.
- There is always room for improvement. Well intentioned—its perception. A lot of GM changes. Nothing about safety from the FMCB. All they think about is fiscal.
- More folks in leadership need to go out and make people feel included.
- Management created a culture when you ask a question they say, “just do what we say”.
- I came here wanting to do a good job. There is no good communication—total reactionary. Everything is after the fact—there is no insight.
- Newbies are “good idea boys”. But nothing gets done. They need to talk to people (in the field) and leave their cube.
- Bringing new people in—putting them in harm’s way because they are not experienced.

## Teamwork

- Silos—there is a lack of clarity on who does what. Makes it hard to hold anyone accountable.
- Silos makes everything take longer and harder to do. Surprised—working here for 2 years and I just learned about a missed opportunity sitting here in this focus group.
- Need to be more of a team rather than pitting us against each other; or everyone should just share information.
- The culture struggles with who is the internal customer. There are siloes within departments. There is not a level of cooperation among departments.

## Internal Communications

- Onboarding? I was shocked. Just got my badge and benefits. T drops the ball on giving good info about the organization and culture.
- Even my department. No information about responsibility—authority level—no clue. Had to figure it out. We call ourselves CSI.
- First year was tough—real lack of a welcome. Thirteen years later—there have been ebbs and waves. I’m on a wave right now.
- Communications needs to come from the top down. There is no newsletter. What are the good things we are doing?—share the big wins. Instead we get, “Well that’s how we always did it.”

## Managerial Communications

- Managers—some are good—some are not. They don't know how to convey a message and handle stress.
- I've been here for years. The place is different. When I am on the clock I own this place. The public is my boss. I wish I could brag about the T. I do not want to move up. I make more than my supervisor with overtime.
- It's not attractive to advance to management—you get a pay cut and they beat you up all day.
- Budget cut issues causes lack of manpower. We are more reactive and need to be more proactive. Why bother to call it in—nothing is going to happen. They are afraid of elevating issues.
- They don't treat people respectfully.
- Employees are treated as guilty until proven innocent.
- Need to work from the bottom up, not the top down. My boss says—"I was directed to do this" Why? Management needs to get input from the boots on the ground.
- They don't consider that you are on the frontline. They forgot where they came from. Sitting in their car during the winter. Why don't they grab a shovel!
- They are not trained to listen. They need to be trained on how to give orders. They bring everyone down.